

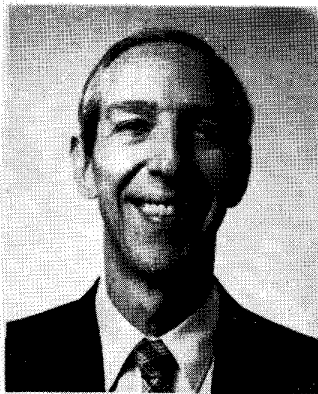
# IA INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS EE *Newsletter*

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Editor: David L. Williams    Contributing Editors: Paul McArdle, Tony Scanlan and Marshall Thomas

Second Quarter 2002

## President's Message



The year is moving quickly along and there are many activities to report on. As you receive this edition of the Newsletter, we will be quite close to the Aberdeen conference, the 25<sup>th</sup> International meeting, taking place on June 26-29. I hope many of you have registered and plan to attend. The British Institute for Energy Economics and the IAEE staff have done a tremendous job in putting together an

extremely interesting and exciting conference. There should be plenty of time for learning, networking, and with many extra hours of day light, enjoying the beautiful Scottish countryside.

We have continued the program to appoint student Council members to participate in IAEE activities with the appointment of two students, Miroslav Honzik from the Department of Economics at the Czech Technical University (?) in Prague, Czech Republic, and Peter Kobos, a graduate student at Rensselaer Polytechnic Institute. We welcome them to the Council and look forward to their active participation. They have big shoes to fill since our two previous students Stine Grenaa Jensen and Alberto Elizade Baltierra did a magnificent job and have really led the way for the future. We plan to repeat our very successful student scholarship program again this year. Announcements for this program will be made later this year.

We are continuing our efforts to ensure that the IAEE remains a strong, growing organization. The Council has voted to support the 2003 North American meeting in Mexico City with a cash grant of \$7500 and a backstop loss provision of \$7500 (IAEE will pay up to \$7500 for any loss that occurs). While we expect the Mexico meeting to be successful both substantively and financially, the Council decided that it was worth a small financial risk to hold the meeting in a new location and help build the IAEE affiliate in Mexico. We will be considering other proposals for financial support on a case-by-case basis. In an effort to extend our reach into China, we are now working with a group of interested people in Shanghai with the idea of holding a day and half seminar in Shanghai, perhaps in late October or early November, again to extend

our programming and develop new interest in the IAEE. Stay tuned on these developments.

Let me shift focus to what I consider one of the more interesting issues in the world oil market – the resurgence of Russia as a producer and exporter. For those of you who watch the market closely, the Russian increases in production should have come as no surprise. Since the bottom fell out of the Russian economy in 1998, there have been major shifts in investment in the oil sector. Recall that oil prices starting surging shortly after the August 1998 Russian economic crash. In some ways this crash helped Russia in the long run more than it hurt. With higher oil prices and increasing exports, Russia received dollars for its exports while paying deflated rubles for its cost of production. This led to substantial increases in cash available for the largest Russian oil companies. With more cash available, internal investment increased substantially in existing fields. The largest Russian oil companies started paying attention to corporate governance issues with increasing success. Rather than draining assets out of the companies – a common occurrence prior to 1998, money was flowing back into the companies. The banks that had bought the oil companies were turning to experienced

*(continued on page 2)*

## Editor's Notes

Frits van Oostvoorn and Monique Voogt report on a study of French, German, Netherlands and Belgium power markets as impacted by EU deregulation directives. They conclude that in the short and medium term, market electricity prices in France and Belgium will approach average production costs and be higher than those of Germany and Netherlands. Cross-border trade will have limited impact on price formation.

Paul Tempest looks at OPEC and identifies its key characteristics, its strengths and weaknesses and concludes with ten guidelines of OPEC strategy, indicating how the organization is likely to respond to imbalances between oil supply and demand over the next few years.

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### **President's Message** (continued from page 1)

international oil industry executives to run the companies as oil companies, not as cash cows. The experienced oil industry executives brought in the best western technology to rehabilitate oil fields that were mismanaged. In-field drilling, well workovers, secondary and tertiary recovery techniques, horizontal drilling, and other advanced oil field technology help revive a declining Russian oil industry. Production started its climb from about 6 million barrels per day (bpd) in 1998 to 6.5 million bpd in 2000 to over 7 million bpd by 2001 with more to come this year. Expectations for 8 million bpd in the next two years are quite sound. Russian exports have climbed with the resurgence in production since the domestic economy has not been able to absorb the production increases. Exports from Russia are now between 2.5 and 3 million barrels per day (and over 4 million bpd if Kazakhstan, Azerbaijan and Turkmenistan are included). This rebound in the Russian oil industry has set up a confrontation with OPEC and other non-OPEC producers. The implications for Russia and the international oil market will be discussed in a future message.

Len Coburn

### **Editor's Note** (continued from page 1)

Williams Olatubi and David Dismukes examine three fundamental issues for estimating regional economic impacts associated with offshore drilling activities: development of unit costs for such activities, expenditure profiling, and the development of onshore allocations of the economic impact of these activities. They examine the relative difference in the impacts between shallow and deep water for exploratory drilling.

Deepak Sharma looks at the evolving nature of the regulatory processes in the Australian electricity industry and concludes that the regulatory framework is typified by a high degree of jurisdictional overlap, ambiguity, confusion, inconsistency and unaccountability. Further regulation seems to be following rather than guiding the development of the electricity industry.

### **Nominations for IAEE Council Contested Elections Planned**

The Nominations Committee is planning to introduce contested elections (more than one candidate for an office) in the coming elections and is seeking recommendations for nominations for a series of IAEE Council posts that are to be filled later this year. Recommendations for nominations are sought for the posts of:

President-elect  
VP and Treasurer  
VP Development and International Affairs

The Nominations Committee is hoping to broaden the membership of the Council and to achieve greater diversity. Please forward any nominations by May 15 to:

Peter Davies  
Chairman Nominations Committee, IAEE  
28790 Chagrin Boulevard, Suite 350  
Cleveland, OH 44122, United States

Or by e-mail to [iaee@iaee.org](mailto:iaee@iaee.org)

### **CALL FOR PAPERS**

5<sup>th</sup> USAEE/IAEE

Allied Social Science Associations Meeting  
Washington, DC – January 3 - 5, 2003

The IAEE annually puts together an academic session at the ASSA meetings in early January. This year's session will be structured by Carol Dahl of the Colorado School of Mines.

The theme for the session will be "*Current Issues in Energy Economics and Modeling*." If you are interested in presenting a paper, please send an abstract of 200-400 words to Carol Dahl at ([cadahl@mines.edu](mailto:cadahl@mines.edu)) by May 25, 2002. If you are willing to be a paper discussant, email your interest by June 15, 2002.

Preliminary decisions on papers presented and discussants will be made by July 1. The program including abstracts will be posted at [iaee@iaee.org](mailto:iaee@iaee.org) by September 1, 2002. Papers and comments will be published with those for the North American meeting of the USAEE/IAEE that follows the January meeting.

Please send abstracts in electronic format that is easily converted into program information. (e.g. word, wp, text).

For complete ASSA meeting highlights and pre-registration information please visit:

<http://www.vanderbilt.edu/AEA/index.htm>

### **Two Aberdeen Conference Highlights Announced**

#### **Chief Executives to Meet**

Chief Executives of Global Energy Institutes will meet in Aberdeen on 26th June immediately prior to the IAEE Annual International Conference.

The annual *Global Energy Coordination* meeting will be held in Aberdeen on the afternoon of 26th June. This meeting is chaired by the Secretary-General of the World Energy Council, Gerald Doucet. The Chief Executive Officer of each of the following organisations will be present or represented:

- o World Petroleum Congress
- o International Gas Union
- o Eurelectric
- o IAEE
- o World Nuclear Association/Uranium Institute
- o International Federation of Industrial Energy Consumers
- o World Coal Institute

The purpose of the meeting is to co-ordinate future plans (to avoid clashes), to exchange information on how these organisations operate and to co-ordinate data and statistical systems.

#### **BP Annual Statistical Review launch at IAEE Aberdeen**

The 2002 *BP Annual Statistical Review* will be launched by Peter Davies, Vice-President and Chief Economist, BP at 09.50 on Saturday, 29th June at the Conference with a detailed commentary on recent energy trends, current developments and prospects. Copies of the *BP Review* will be available for all attendees.

# 22<sup>nd</sup> USAEE/IAEE NORTH AMERICAN CONFERENCE

Hosted by:  
United States Association for Energy Economics

## Energy Markets in Turmoil: Making Sense Of It All

Sheraton Wall Centre Hotel – Vancouver, British Columbia, Canada  
October 6-8, 2002

### Conference Objective

To explore the forces driving the dramatically changing energy landscape – including price volatility, global uncertainty, market restructuring, sustainability imperatives, policy constraints and technology

### Plenary Sessions

Energy Security in the 21<sup>st</sup> Century

California Fallout: What Useful Lessons Can be Learned

Continental Energy Markets Prospects

Canada-U.S. Natural Gas Trade

Offshore Petroleum Industry: Reflections on Moving Forward

Fossil Fuels and Sustainability: Like Oil and Water?

North American Regulation: Are We Getting It Right?

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

**Abstract Submission Deadline: May 1, 2002**  
**(include a short CV when submitting your abstract)**

Anyone interested in organizing a session should propose topics,  
motivations, and possible speakers to:

Mark Jaccard – (p) 604-291-4219 / (f) 604-291-5473 / (e) [jaccard@sfu.ca](mailto:jaccard@sfu.ca)

Abstracts for papers should be 200 words or less. At least one author from an accepted paper must pay the registration fees and attend the conference to present the paper. The lead author submitting the abstract MUST include complete contact details (e.g., mailing address/phone/fax/email coordinates). All abstracts should be submitted to:

David Williams, Executive Director, USAEE/IAEE  
28790 Chagrin Blvd., Suite 350, Cleveland, OH 44122 USA  
Phone: 216-464-2785 / Fax: 216-464-2768 / E-mail: [usaee@usaee.org](mailto:usaee@usaee.org)

General Conference Chair: Arnold B. Baker  
Program Chair: Mark Jaccard  
Arrangements Chair: David L. Williams

**AGAIN THIS YEAR: USAEE Best Student Paper Award (\$1,000 cash prize plus waiver of conference registration fees). If interested, please contact USAEE Headquarters for detailed applications / guidelines.**

**STUDENT PARTICIPANTS: Please inquire also about scholarships for conference attendance.**  
**CONTACT: Dave Williams, Phone: 216-464-2785 / Fax: 216-464-2768 / E-mail: [usaee@usaee.org](mailto:usaee@usaee.org)**  
**Interested in touring Vancouver?? Visit [www.tourismvancouver.com](http://www.tourismvancouver.com) today!!**

**British Institute for Energy Economics**  
**International Association for Energy Economics**  
**25<sup>th</sup> International Conference**  
**Aberdeen Exhibition and Conference Centre, Aberdeen, Scotland**  
**June 26<sup>th</sup> – 29<sup>th</sup>, 2002**

**Innovation and Maturity in Energy Markets: Experience and Prospects**

**\*\*\*\*\* Program & Social Activities \*\*\*\*\***

On behalf of the British Institute for Energy Economics it is our pleasure to invite you to Scotland for the 25<sup>th</sup> International Conference of the IAEE. Please mark your calendar for this important event, the silver jubilee conference, and the first time that the IAEE has come to Scotland.

**Session Themes and Topics**

**Renewable Energy:** The pace of development of all forms of renewables. Barriers to development. Technical progress, reduction of costs and government incentives.

**The Role of Government:** Government regulation in all stages of the energy industries. The impact of environmental policies on energy. Taxation of energy. The evolving geopolitics of energy.

**Natural Gas:** The problems of gas development at global and regional levels. The determination of prices. The reserve position. The place of natural gas within the power generation sector. Security of Supply.

**The Oil Industry:** Technology and the resource base. The development of the offshore industry. Taxation. New frontiers. The Future of the North Sea Industry. Oil price developments and market mechanisms.

**IT and the Energy Sector:** How has the impact of IT developed, or is the revolution over? The place of e-commerce. The provision of information by governments and its role. IT and market transparency. IT and its impact on costs.

**Conference Registration**

Registration may be made electronically via the special conference website at <http://www.abdn.ac.uk/iaee>. This gives the full details of the fees payable. Alternatively payment can be made by mail to Fiona Flockhart, IAEE Conference Secretariat, Room 104, University of Aberdeen, Regent Walk, Aberdeen AB24 3FX, UK. Fax No. +44 (0) 1224 272576. Email: [f.j.flockhart@abdn.ac.uk](mailto:f.j.flockhart@abdn.ac.uk). Cheques should be made payable to University of Aberdeen – IAEE Conference.

**Hotel Reservation**

Favourable rates for delegates have been made with 4 hotels. Bookings should be made through Aberdeen and Grampian Convention Bureau, 27 Albyn Place, Aberdeen AB10 1YL. Tel. No. +44 (0) 1224 288815. Fax No. +44 (0) 1224 581367 or electronically at <http://www.abdn.ac.uk/iaee>.

Visit the conference website at [www.abdn.ac.uk/iaee](http://www.abdn.ac.uk/iaee).

**Brief Program Overview**

**Thursday, 27 June 2002**

9am-10.30am	Opening Session – Plenary One - Towards a New Global Energy Policy. Lord Lawson*, BIEE President, Gordon Brown*, UK Chancellor of Exchequer”, Vicky Bailey*, Assistant Secretary, US DOE, Robert Priddle, Executive Director, IEA, Gerald Doucet, Sec – Gen. World Energy Council.
10.30am-11am	Coffee Break
11am-12.30pm	Plenary Two - The North Sea in a Global Context. Tony Hayward*, Group Vice-President and Group Treasurer, BP, Brian Wilson*, UK Minister for Energy, Kjell Pedersen, CEO, Petoro
12.30pm-2pm	Lunch - Lord Lawson on Energy Privatisation; IAEE Awards
2pm-3.30pm	Co-plenary Three - Middle East - Chair: Herman Franssen; Nader Sultan, Kuwait Petroleum; Fadel Chalabi, COGES, London; Rashid al Barwani, Ministry of Petroleum, Oman; Paul Stevens, University of Dundee; Paul Tempest, Windsor Energy Group; Fereidun Fesheraki, East-West Center
	Co-plenary Four - US Regulation - Chair: Michelle Michot Foss; Shirley Neff, US Senate Committee on Energy and Natural Resources, Brett Perlman, Texas Public Utilities Commission, Donald Santa, Troutman Sanders
3.30pm-4pm	Tea Break
4pm-5.30pm	Parallel Sessions 1 to 5 - 1.Student Session: Chair: Chang Youngho; 2 Renewables: Chair: Elizabeth Marshall; 3. European Energy Issues: Chair: J-P Cueille; 4. Climate Change: Chair: David Laughton, University of Alberta
	5. Potential for the International Companies: Chair: John Holding, Saudi Arabian Texaco
7pm-10pm	Gala Dinner, Ardoe House Hotel, South Deeside Road, Blairs, Aberdeen

**Friday, 28 June 2002**

8am-1pm	Registration at Aberdeen Exhibition and Conference Centre
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9am-10.30am	Co-plenary Five - Topic to be confirmed. Chair and Lead speaker: David Newbery*, University of Cambridge, Jonathan Stern, RIIA, L. Hunt, D. Hawdon, P. Levine & N. Rickman, University of Surrey, UK, Reinhold Hass, Austria; other speakers to be confirmed Co-plenary Six - Energy Deregulation and Liberalisation in Developing Countries. Chair: Paul Stevens, University of Dundee, John Besant-Jones, The World Bank, Peter Pearson, Imperial College, London, Francisco Barnes-Regueiro, Mexico, Matthew Leach, UK and Matthias Ruth, USA
10.30am-11am	Coffee Break
11am-12.30pm	Co-plenary Seven - Asia: Joint Chairs: Hoesung Lee and K. Yokoburi; Robert Ebel, CSIS, Washington, DC; Ho-Seok Kim and Eui Soon Shin, Korea, Keun-Wook Paik, UK, Ken Koyama, Japan Co-plenary Eight - Trans-European Issues - Chair: Arild Nystad; Jonathan Stern, Imperial College/RIIA; Aad Correlje, Netherlands, Hans Auer, Germany, VA Krykov and KN Milovidov, Russia.
12.30pm-2 pm	Lunch – The Perils of Forecasting - Lead Speaker: Michael Lynch
2pm-3.30pm	Parallel Sessions 6 to 10 - 6. Oil Issues, Chair: Andre Plourde; 7. Natural Gas Issues, Chair: Jonathan Stern; 8. Unsustainable Development; 9. Nuclear Issues, Chair: Chris Anastasi; 10. Market Instruments, Chair: Adrian Gault
3.30pm-4pm	Tea Break
4pm-5.30pm	Parallel Sessions 11 to 15 - 11. The Role of Government, Chair: David Jones, BIEE; 12. Efficiency of Transport, Chair: Lee Schipper; 13. OPEC and Related Matters, Chair: Fereidun Sioshansi; 14. IT and the Energy Industries, Chair: David Rose; 15. De-Regulation and Re-regulation, Chair: Maureen Crandall
7pm-10pm	Scottish Gala Evening, Beach Ballroom, Aberdeen

### **Saturday, 29 June 2002**

9:00 – 9:40am	Plenary Nine - Malcolm Brinded, Group Managing Director, Shell Group
9:50 – 10:30am	Plenary Ten – Peter Davies, Chief Economist BP, plc. A Global Energy Overview and Launch of the 2002 Annual BP Statistical Review
10.30am-11am	Coffee
11am-12pm	Parallel Sessions 16 to 20 - 16. Petroleum Taxation, Chair: Alex Kemp, Aberdeen; 17. Electricity, Chair: Peter Pearson; 18. Macro-Economics of Energy, Chair: Inje Paik; 19. Market Forces in EU, Joint-Chairs: Benjamin Hobbs and Frits van Oostvoorn; 20. Renewables 2, Chair: Katherine Mitchell
12pm-12.45 pm	Plenary Eleven – IAEE Past Presidents: Reflections on Twenty-Five Years of the World of Energy Chair: Leonard Coburn, IAEE President

\* Subject to final confirmation

### **Social Delights**

The Conference will be held in Aberdeen, Scotland, the “Oil Capital of Europe” and operations centre for North Sea oil. Major and smaller oil companies and service companies have prominent presences in the city. The timing of the conference ensures that attendees can enjoy daylight for nearly 24 hours per day. June is also generally the warmest month of the year. Aberdeen has many attractions including an ancient University. It is also the ready gateway to magnificent scenery, many castles, ancient and modern, malt whisky distilleries and golf courses.

The welcome reception on the evening of 26 June will be held in the Elphinstone Hall at the ancient University of Aberdeen. This will give delegates an opportunity to see the campus, including the unique King’s College chapel.

On the evening of 27 June the gala dinner will be held at Ardoe House, a magnificent 19<sup>th</sup> century Baronial Mansion with modern ballroom facilities. It is located in beautiful surroundings beside the river Dee about 4 miles from the city.

On the evening of the 28<sup>th</sup> there will be a Scottish evening featuring a reception with Scottish food and entertainment.

### **Cultural Programme**

Three social tours will be available. During the conference on 27<sup>th</sup> June a coach tour of Aberdeen for partners has been arranged. This will include a visit to some of the ancient buildings in the city including the University (founded 1495), the spectacular beach and the famous Winter Gardens. On 29<sup>th</sup> June, after the conference, a visit to Royal Deeside has been arranged. The highlight of this tour is a visit to Crathes Castle which dates to the 16<sup>th</sup> century. This castle has unique turrets and interiors and beautifully laid out gardens. On Sunday 30<sup>th</sup> a tour has been arranged to visit Fettercairn malt whisky distillery and Fasque House. This involves a journey over spectacular highland scenery. A sample of the whisky will be available. Fasque House dates to the 19<sup>th</sup> century. It was and is the family house of the Gladstone family, including the UK Prime Minister William Ewart Gladstone. The interior has been extremely well preserved to illustrate how he lived back in the 19<sup>th</sup> century.

### **Getting to Aberdeen**

Aberdeen is served with 11 daily direct flights from London (Heathrow and Gatwick). There are also several direct flights from London Luton (Easyjet), London City airport, Manchester, Newcastle, Birmingham, Leeds/Bradford, Humberside, Norwich and Glasgow. There are direct international flights from Amsterdam and Stavanger. A special deal has been struck with KLM/Northwest for conference delegates. For full details see the special website at [www.abdn.ac.uk/iaee](http://www.abdn.ac.uk/iaee). The airport is 20 minutes drive time to the City Centre or the Conference Centre. There are direct train links from London and many other cities in the UK to Aberdeen.

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## Development of Electricity Wholesale Prices in Northwest European Markets

*By Frits van Oostvoorn and Monique Voogt\**

### Abstract

In 1996 the Electricity Directive (followed in 1998 by a Gas Directive) was adopted in the EU which started an enormous restructuring process of electricity and gas markets in EU Member states. In the continental European countries a step-wise implementation of the EU Directives has resulted in a dynamic transformation process with great unpredictability and anomalies in market prices. This study, which was finalised at the end of 2000, analysed the outlook for deregulation of power markets, the changes in electricity production technologies, ownership, fuel consumption, cross border trade, production costs, short-run and long-run marginal costs and wholesale price of electricity for four north-western European countries (France, Germany, the Netherlands and Belgium). The main conclusions are that in France and Belgium, in the short and medium term, electricity prices will approach average production costs of power production, which results in market prices higher than Germany and Netherlands. In the next five or more years cross-border trade will have a limited impact on price formation. Gas consumption of power markets in these four countries will increase substantially (doubling in the next 10 years), particularly for peak power.

### Introduction

If we assume over capacity on the Northwest European electricity markets and we assume that markets are tending towards full competition, short run marginal costs are a more accurate approximation of future market prices than average costs. However, if due to demand increase or mothballing or closing down of existing capacity there is a need for new investments in capacity, the long run marginal costs (LMRC) of production seems a more accurate approximation of the expected market price. Finally other factors such as market power can push up prices even more. So in a perfect competitive market firms act as price takers, i.e. they consider the price as given and consequently act as if their output will not alter it. Firms will not produce if the market price is higher than the short run marginal cost, which is given by variable costs such as the fuel, operating and maintenance costs. Costs that do not depend on the quantity of power generated are fixed costs and these are irrelevant in the short-run production decision making. In the long term companies are able to alter the allocation and composition of all production factors and, therefore, if they will not cover the total costs of production they will stop operating.

When firms exercise market power they act in a way that they can influence the market price. Under the uniform price setting system in which the price is settled by the most expensive plant dispatched, there are two methods of exercising market power. The first one is strategic bidding. This method comprise companies bidding prices that are higher than their operational costs of the plants that will probably set

\*Frits van Oostvoorn and Monique Voogt are with the Energy Research Centre of the Netherlands, ECN. They can be reached at oostvoorn@ecn.nl

the market clearance price, in order to increase the price and therefore the benefits. This method provides a risk for the firms, as if they bid too high they could probably not be dispatched.

The second method consists of companies withholding some of their capacity in the bidding process so as to cause more expensive units to increase the system supply curve, and consequently increase the market clearance price. Firms opting for this strategy consider that losses in cutting infra-marginal capacity will be outweighed by gains from other dispatched capacity.

The electricity industry is characterised by a highly variable price inelastic demand, significant short run capacity constraints, and extremely costly storage. These factors combined make the concentration of a market not a good indicator of the potential for, or existence of, market power. The possibility for the firms to exercise market power also depends on a number of other factors. These are the amount of demand in a certain market, the fringe production capacity, the demand elasticity and the transmission capacity. When electricity demand levels are low, it is difficult for utilities to exercise market power, as generally the number of bidding plants is relatively high. If a generator decides either to bid high prices or to withhold available capacity, other generation units will be able to dispatch their plants. At high demand levels, the number of competition plants tends to reduce. Consequently utilities that own marginal plants are able to withhold output and increase the market clearance price. The amount at which some utilities can exercise market power depends on the fringe production capacity, which generally are inclined to bid low in order to dispatch as much electricity as possible. Price mark-ups can only be sustained at high demand levels when demand is not price responsive, i.e., when consumers do not alter their behaviour when prices increase. Transmission congestion occurs whenever power deliveries are limited by the size or availability of transmission resources needed to serve a load. Constrained transmission capacity into certain regions can have important impacts on the level of competition in those markets by restricting potential short-term entry, and, therefore, allowing the enforcement of monopolistic behaviour.

Forecasting wholesale electricity prices for the four EU countries over the period 2000-2015 in the current transformation phase of the EU electricity markets is a very complex undertaking. An enormous number of uncertainties are influencing the electricity wholesale prices today and will be in the next decade. For this reason, the study is based on a combination of qualitative and quantitative analysis. The qualitative analysis concerns an assessment of the current and expected development of deregulation in the four countries conducted by ECN. The quantitative analysis is supported by a model called PRIMES (NTUA, 2000) and a complete database of the electricity market in the four EU countries (ESAP, 2000). Furthermore, ECN analysed and assessed the cross-border trade and other conditions for production, trade, transport of electricity and taxes, tariffs, etc. in the electricity markets in the EU.

The following approach was adopted for estimating wholesale prices:

- In-depth analysis of the current market structure in four northwestern European countries and the strategies of the

main players in these four markets (market power).

- Analysis of the status and role of cross-border transmission capacities between these four countries regarding the scope for cross-border trade and influence on price formation.
- Assessment of efficiency and costs of current production capacities in these countries.
- Identify and analyse new investment opportunities, particularly regarding gas technologies.
- Development of a reference (scenario) forecast for calculating electricity costs (prices).
- Conduct sensitivity analysis on the reference scenario to 'forecast' ranges for electricity production costs per country.
- Estimation of the short run and long run marginal cost curves.
- Estimate developments of electricity wholesale prices for the four EU countries regarding the competitiveness in each country.

To calculate the production costs (first crude approximation value for developments of market prices) for five consumer categories in the four countries, assumptions were made on the implementation of the EU Electricity Directive (regulatory setting), fuel prices, economic (electricity demand) growth, etc. Furthermore we also assume the establishment of fully competitive gas markets in Europe (strong assumption). To ascertain the possible and most likely developments of electricity prices under different circumstances a number of policy/sensitivity variants are analysed with the model. Finally, expected electricity prices were estimated based on plant (technology) production costs, actual production and load curves of the different generation options in the scenarios and other information, such as scattered information on 'forward prices', SRMC and LRMC curves and the influence which is expected from the competitiveness of the market, thereby influencing company behaviour (implementation of the EU Directive) in each country. Altogether this leads us to as careful as possible an estimation of the expected electricity prices in each of the four countries.

The structure of the paper is as follows. In Section 2 we present the current situation and in Section 3 the results of the scenario analysis, including a sensitivity analysis. Section 4 contains the analysis and expectations regarding the electricity prices for the next fifteen years in the four northwestern European countries.

### **Current Situation**

In the Netherlands, the first phase of liberalisation started in 1999, when the first 33% of the market was opened for competition. The new Dutch electricity Act further stipulates in 2002 a 66% and in 2004 a complete opening-up of the market. Adopted was the Regulated TPA system and DTe was appointed as regulator. DTe sets conditions for grid access tariffs after submission of proposals on this by TSOs. In 1999 the Amsterdam Power Exchange (APX) was established for spot trade. In the Netherlands the main factor influencing electricity price formation in the year 2000 was the so-called Protocol, which is an agreement between the four major generators and the distribution companies (utilities), stipulating from 1997 till the end of 2000 mandatory sales of electricity at fixed prices. Furthermore, the contract-

ing of additional volumes via the spot market and thus by imports was limited due to cross-border capacity made available for current long-term contracts between producers and foreign companies. On top of that, unexpected revisions of generation plants took place. The consequences were erratic rises in wholesale prices and panic reactions by utilities facing shortages in their purchases to meet commitments from already contracted sales to consumers. However, it must be pointed out that this volatility in prices concerned only peak load supplies and that the volume of electricity traded via APX covers only about 2-3% of the total electricity supplies to the utilities.

Germany, the largest European electricity market, started the liberalisation process in April 1998 with a sudden and complete opening up of the market. It adopted a negotiated TPA and, therefore, it claimed that it did not need a regulator and an Independent System Operator. As a consequence of this sudden liberalisation the transmission constraints increased dramatically and tariffs became relatively much higher than in the neighbouring countries. On the other hand, the commodity prices for residential and industrial consumers declined dramatically in 1998 but recently are more or less stable and moving upward.

In France EDF has the monopoly over production, transmission and most of the distribution activities. In 2000 a law was introduced to meet the EU requirements for implementation of the EU Directive. It stipulates that consumers (larger than 16 GWh), about 30% of the market, are allowed to choose their supplier. About 75% of electricity generation is by nuclear plants. Regulated TPA was adopted and a system operator RTE was appointed. Nevertheless, the emergence of competition is largely reduced by the favourable position of EDF and existing generation overcapacity in France. Also divestment of the EDF structure seems very unlikely. So far the number of eligible consumers leaving EDF as supplier is minimal.

Belgium started late, May 2000, with enabling large consumers (<40 GWh/year) to freely choose their supplier. Only in 2007 will the other consumer markets be opened for competition. The company Electrabel produces 93% of the electricity, of which 55% is produced by nuclear plants. Belgium adopted the system of regulated TPA. The regulator's situation, however, is not very transparent. The national coordinator of the production, etc. of electricity CPTE (subsidiary of Electrabel) proposed itself to be the system operator and also published grid access tariffs. So far ERC (Regulator) has not officially named a system operator.

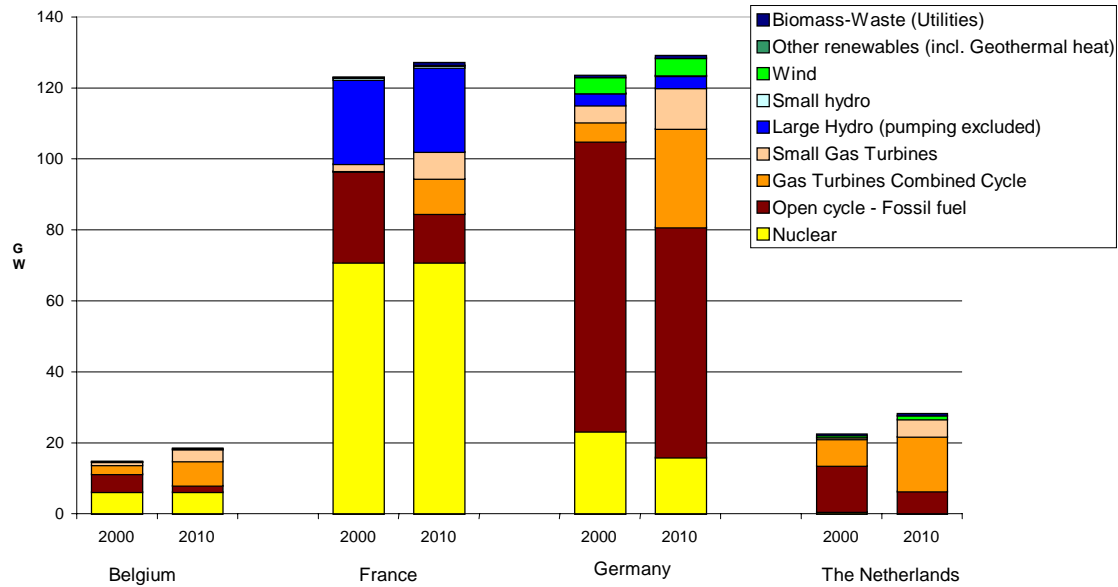
The main conclusion drawn is that the models implemented for and the pace of liberalisation is very different in the four EU countries. Another aspect that should be pointed out (but is not elaborated in this paper) is the fact that the system and level of network charges, still differs largely between the four countries.

### **Electricity Market Scenario**

Based on a large number of assumptions concerning GDP, varying between 1.7 and 2.7% p.a. and demand growth, fuel prices (crude 25 US\$/bbl in 2000 to 16 US\$/bbl in 2002 and later), etc. in the four countries, the most likely development of the electricity market was calculated for the next fifteen years.

*(continued on page 8)*

**Figure 1**  
**Capacity Per Country and Type of Plant [GW]**



**NW European Electricity Wholesale Prices** (continued from page 7)

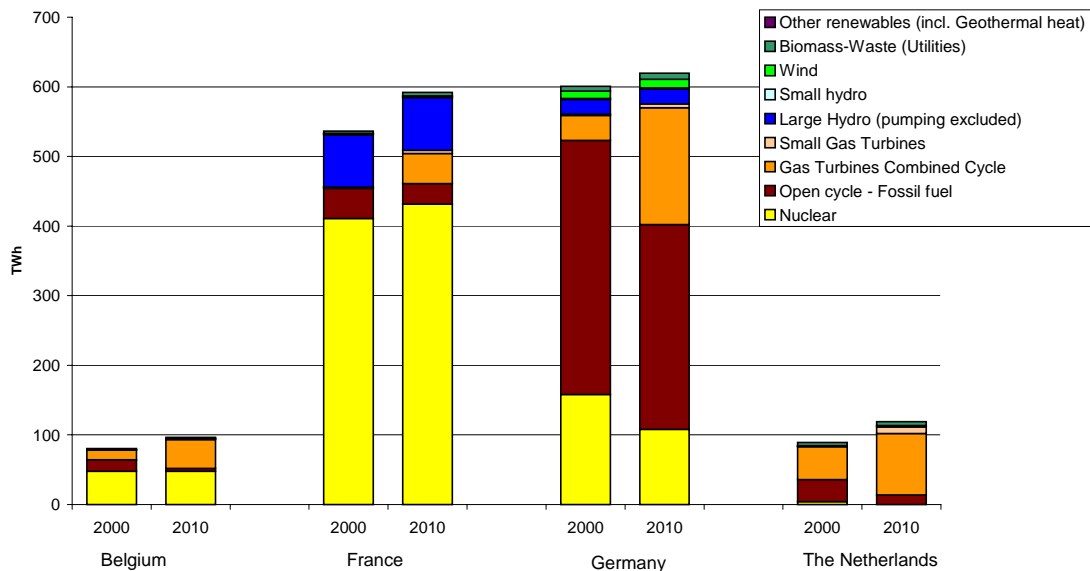
The key developments of the scenario are:

- generation capacity developments in the four countries,
- electricity production and fuel input,
- electricity trade between the countries,
- electricity generation costs (approximation of electricity wholesale prices).

The outlook for the total capacity in the four countries is presented in Figure 1. Generally the capacity of CCGT plants increases, whereas that of open cycle plants decreases. Also the contribution of renewables increases in most countries. In Germany the capacity of nuclear plants decreases slightly. Despite the decreasing overall demand for electricity in

Germany the total capacity increases slightly because the reserve margins increase. This seems to contradict the current large overcapacity on the northwest European market. However, it should be noted that this is merely a replacement of older and less efficient plants that cannot operate profitably at low levels of electricity prices and are thus replaced by higher efficiency plants. These model results are clearly 'supported' by some recent developments on the German and Dutch power markets. In Germany, RWE and E.ON have announced the closing of a significant part of their capacity, while RWE has recently opened a new high-efficient STAG CHP unit at Bayer (480 MW, Oct. 2000) and has started building one at Thyssen-Krup Stahl (255 MW, expected to operate end of 2002). In the Netherlands, Epon has announced it will close two of its plants (523 MW and 352

**Figure 2**  
**Production of Electricity [TWh]**



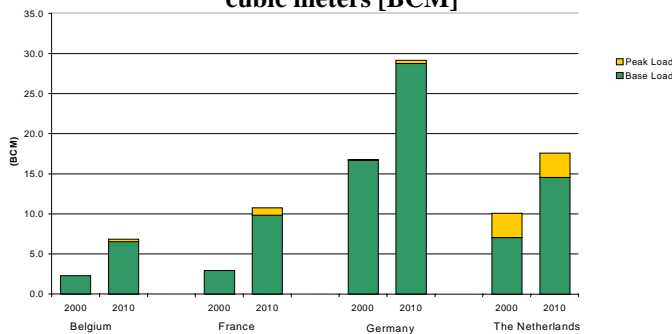


MW) from January 2001, while other parties such as Norsk Hydro are developing plans to invest in new gas-fired production plants.

Due to the changes in the direction of investments in new capacity and utilisation of existing capacity, the structure of electricity generation also gradually changes from 2000 to 2010 (see Figure 2). Due to relatively low oil and gas prices, the contribution of plant technologies using natural gas increases and that of solids (coal) decreases. Low natural gas prices appear to be favourable for penetration of CHP, particularly in the Netherlands. As a consequence fuels such as coal and nuclear electricity generation will not contribute anymore in 2010.

As expected, the relative low gas prices in the reference scenario lead to an enormous increase in the use of natural gas for the electricity generation in north-west Europe (see Figure 3). In the year 2000 natural gas is used for meeting peak load only in the Netherlands. However, in the year 2010, the other countries will also be using some natural gas to meet peak loads. Most remarkable is the newly arising gas-fired plants for electricity production to meet (part of) peak load demand in France.

**Figure 3**  
**Natural Gas Use for Electricity Generation in billion cubic meters [BCM]**



Regarding the trade in electricity, the results were as follows. Germany is mainly importing electricity from France during its base load hours period, whereas Germany exports base load electricity during base load hours to the Netherlands. However, during the peak load hours, trade flows are going in the opposite direction. Especially between Germany and France, trade via the pool market is increased considerably. France mainly exports electricity during the base load and it imports electricity during the peak hours. Imports from France during the peak are the result of the relatively favourable diesel prices in Germany. In practise, part of this trade demand could be replaced by cheap (hydro) electricity from Switzerland. However, this option is only partly incorporated in the outcomes since Switzerland is not explicitly taken into account in the study. Besides France, Belgium also exports electricity during the base load hours. In general, one can conclude that countries with a lot of nuclear power plants, such as France and Belgium, are exporting in the period of base load production. The imports contracted from France, including the exports contracted to the Netherlands, mainly involve cross-border transit through Belgium, which in turn also imports electricity from the Netherlands during its peak demand hours. Note that the nuclear plant Thiangé is 32.5% owned by EDF. The Netherlands imports electricity during

the base load demand period. One of the main reasons for contracting (nuclear) electricity imports has been the decommissioning of the Dutch nuclear and other base load power plants. Due to favourable gas prices, the Netherlands to some extent exports electricity during the peak hours.

Finally, to check the robustness of the scenario outputs, particularly regarding the electricity costs for changes in the key assumptions such as fuel prices, carbon taxation etc., a sensitivity analysis was conducted for the following variants:

- relatively higher oil and gas prices (called high prices),
- termination of all fixed trade contracts (called no contracts),
- increase of the investment costs of CHP of 20% (called CHP inv.),
- introduction of a carbon tax of \$ 6.5 per tonne CO<sub>2</sub> (called carbon),
- better utilisation of existing cross border transmission capacities for trade (called transmission).

Only for the 'high prices' and 'carbon tax' variants the production costs are substantially deviating from the reference scenario. For a more elaborate (costs) price analysis see next section.

### Electricity Prices

The price outlook is based on the following analyses:

- current market developments
- current and expected market concentration and power in the four markets,
- current and expected structure of electricity production in the four countries,
- current daily prices and forward prices on the European spot markets,
- average cost, short run and long run marginal costs in the different markets as calculated by the model.

Note that data presented on the reference scenario are based on relatively low world market prices for oil and gas. The outlook for electricity wholesale prices presented in this section is consistent with these oil and gas prices. However, this does not mean that wholesale market prices are assumed to be able to decline to the SRMC of the whole production system as determined by the model calculations. The market price is not determined by the SRMC of the whole production system, but by the price of the highest bid needed to satisfy demand, i.e., the merit order. It is, furthermore, noteworthy to realise that the level of world market prices for oil and gas evidently influences the height of electricity market prices, but that the present trend in price developments seems to be rather robust according to our sensitivity analysis.

### Price Paths and End of Overcapacity

For each of the four countries, two price paths are presented, indicating the most likely scope of future price developments. The two paths are based on a different assumption (relatively slow or faster) regarding the increase of market opening and establishment of competition in the respective countries.<sup>1</sup> Furthermore, the paths don't comprise possible government policies such as enforcing price reductions in non-competitive markets or enhancing transit capacities. Note that the scope of possible developments does not

<sup>1</sup> See footnote at end of text.

(continued on page 10)

### NW European Electricity Wholesale Prices *(continued from page 9)*

include radical policy changes of national governments and/or the European Commission and does not include external market developments such as changes in the implementation of the gas Directive. However, we expect that in all four markets prices will be largely affected by the fact that a large part of the current production system is expected to be closed down in the period 2005-2010, and thus overcapacity in the northwestern European market will decline substantially. As a reference, the long run marginal cost of the price setting base load technology is presented for all countries. For Belgium and France also the long run marginal cost of the complete production system is included as a reference to the absolute upper bound of market prices (see explanation below the corresponding graphs). Note that this latter figure includes both base and peak load supply.

#### Market Prices for Base Load Supplies

The market prices for base load supplies are expected to tend towards the long run marginal cost of the expected price setting technology on the wholesale markets for base load supplies. In most cases this will be a large or medium gas-fired CCGT plant; in Germany this could also be a modern high-efficiency coal-fired plant. For the countries of Belgium and France, market prices are largely influenced by the lack of market competition. EDF and Electrabel, respectively, dictate wholesale prices in France and Belgium, and no serious competition is expected within the next ten years. In spite of over-capacity in both markets, prices in both countries are currently not based on the short run marginal costs but on average costs. The long term trend is influenced by the long run marginal cost of the price setting base load technology, but we expect that the market power of both companies mentioned is strong enough to keep prices higher than long run marginal costs. This is supported by restrictions on import capacities in Belgium and insufficient TPA in both countries.

For Germany and Netherlands, the outlook is significantly different (see Figure 6 and 7). Wholesale market prices in recent years have decreased, especially in Germany, and are currently based on short run marginal costs. This situation is expected to continue until there is no longer overcapacity on the German and Dutch market. At that time, which is expected to be around the year 2006, prices will gradually increase towards the long run marginal costs of a new gas-fired CCGT plant.

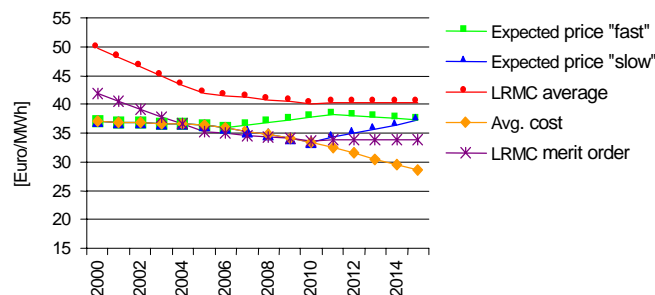
The price outlooks include the following information:

- Expected price of wholesale base load supplies; indicated by a 'fast' and 'slow' price path. The 'fast' and 'slow' paths indicate the possible scope of price developments.
- LRMC merit order: the long run marginal cost of the price setting base load technology on the electricity market of the country indicated.
  - For Belgium and France: Avg. cost: the average cost of electricity production in the electricity market.
  - For Belgium and France: LRMC average: the long run marginal cost of the complete electricity production park.

Next to the price-influencing factors mentioned above, in Belgium the timing and trend of price developments largely

depends on the level of government regulation on the market, see Figure 4.

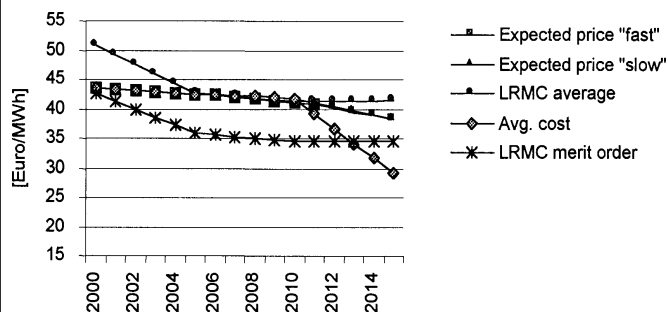
**Figure 4**  
**Expected Wholesale Price for Base Load Capacity in Belgium**



As long as Electrabel can set prices and no efforts are made to either divest Electrabel, improve actual TPA or increase import capacity on the Belgium market, prices are not expected to decline towards German and Dutch market prices. If the Belgian market would be more open to competition, prices would certainly tend towards levels in between Germany and the Netherlands. The discussion on the current situation in Belgium points out the limited possibilities to increase competition in the Belgian electricity market.

The most remarkable fact in the French market is the lack of variation in price developments, see Figure 5. Current wholesale prices are based on average costs, which are not significantly different from the long run marginal costs of electricity production in France. Moreover, for a number of years EDF is expected to remain the only company that is able to set the system marginal price in France. As is the case for Belgium, the average cost of production is likely to decrease significantly due to relative smaller increase of new investments in capacity.

**Figure 5**  
**Expected Wholesale Price for Base Load Capacity in France**



The average costs in both Belgium and France decrease steeply according to the calculations. This is due to the declining amount of new investment, the reduction of over capacity and the increase in operating hours. In Belgium, approximately 1500 MW of fossil fuelled open cycle plants are decommissioned every 5-years, which is steadily being replaced by higher efficiency CCGTs. In France, the calculated reserve margin reduces from 1.47 in 2000 to 1.42 in 2010 and a large number of existing plants are decommis-

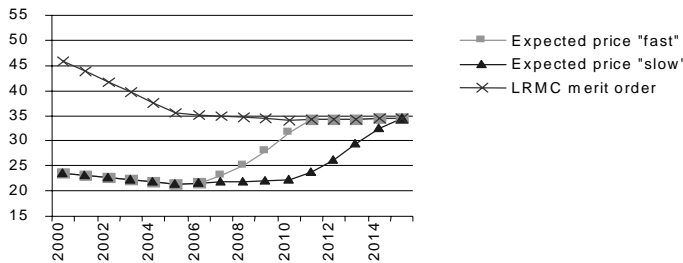
<sup>1</sup> See footnote at end of text.

sioned and replaced by (a somewhat smaller amount of) higher efficiency plants.

The market prices on the German market in the early years will follow the trend in SRMC developments calculated by the model. Around the year 2006, when large amounts of new capacity are required, prices will slowly increase toward the long run marginal cost of the price setting technology.

It is remarkable to notice that prices on the German market are not expected to decrease much further than current price levels. Apparently, wholesale prices have almost reached their absolute minimum at this moment. From earlier analysis we learnt that the Protocol in the Netherlands and restrictions in import capacity have influenced prices upward. However, with the Protocol ending after 2000 and expected increased flexibility and the increase of import capacity, prices are expected to decrease in the short term toward German price levels. As holds for Germany, at the time of ending of the current situation of over capacity on the market, prices will tend to increase towards the long run marginal cost of the price setting CCGT gas-fired technology. This level is expected to be around 1 EURO/MWh lower than for Germany (see Figure 6).

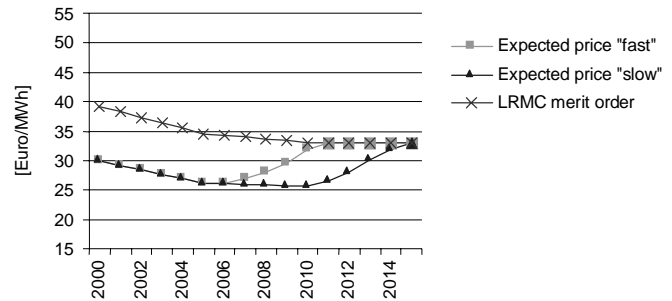
**Figure 6**  
**Expected Wholesale Price for Base Load Capacity in Germany**



Comparison of the price paths of Germany and the Netherlands shows that although current market prices are significantly lower in Germany, in the longer run they will be around 1 EURO/MWh higher than in the Netherlands. This is mainly induced by the relatively lower gas price in the Netherlands. Moreover, earlier analysis has already indicated that given the large scope for gas-fired peak generation in the Netherlands, there is a potential export for peak load electricity from the Netherlands, especially to Germany. The expected price difference supports this possibility. It should, however, be indicated that differences in wholesale prices alone do not determine international trade opportunities. To be able to exploit this possible export potential, sufficient trade capacity between the Netherlands and Germany should be available. Furthermore, it should be noted that costs of transit are not included in the graphs shown above. If the costs of transit exceed the price difference of about 1-2 EURO per MWh, exports are no longer profitable. Given this estimated price difference, it is unlikely that new investments in cross-border transit capacity between Germany and the Netherlands would become cost-effective in the next decade. It is, therefore, expected that firstly the options to increase the net transfer capacity of existing transmission lines will be exploited, and secondly - when this option is satisfied - no new network investments are taking place, but companies operat-

ing on the Germany market will extend their gas-fired peak capacity.

**Figure 7**  
**Expected Wholesale Price for Base Load Capacity in the Netherlands**



**Conclusions**

Focusing on the four northwest European countries it would be fair to state that the transformation from a more or less strongly regulated electricity market towards a full competitive market is currently in a beginning phase. Clearly this process of transition and changes takes place faster in the Netherlands and Germany than in Belgium and France. So given the fact that current differences in generating capacity, outlook for regulatory systems and relatively limited cross-border trade capacity, over the five next years prices in Germany are expected to be the lowest of all four countries. Thereafter, however German prices will rise, and become slightly higher than in the Netherlands, mainly due to the relative lower gas prices in the Netherlands, in the long run. Although it is expected that (average) electricity prices in Belgium and France will gradually decline and thereafter stay almost constant, they will probably remain higher than in the other countries in the next decades.

Of course, other factors will influence the future wholesale prices in northwestern European countries. Electricity companies will merge, relatively high cost capacity with limited flexibility will be dismantled, all of which is part of a dynamic process. The emergence of the IPP and particularly small and medium scale generators of electricity based on renewables or highly efficient Combined Cycle Gas Turbines plants might influence wholesale prices of electricity in the future. Finally the EU Regulators will have to avoid that companies will create market power for pushing up prices, above acceptable levels. More research in these topics is required.

**Footnote**

<sup>1</sup> Note that we believe that, although market prices are expected to converge as is indicated in the graphs, for the next ten years full integration of electricity markets in Northwest Europe will not be achieved.

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## OPEC, The Opaque - A Valuable Political Screen

By Paul Tempest\*

“We love to expect and, when expectation is disappointed or gratified, we want to be again expecting”

Dr Samuel Johnson  
1709-84

OPEC Meeting No 86, Geneva, September 1989

“To bake today an OPEC pie  
Take a barrel of crude. Deep fry  
Red herrings. Add soft soap to the quota.  
Allocate then the dough pro rata”

From 15 Poems for OPEC, 1985-91

### Editor's Note:

*Between 1985-91, Paul Tempest went to 15 OPEC Meetings, each lasting 3-15 days, as the on-the-spot representative of the Shell Group. For the Oil Ministers and also the press and others outside the council door in Geneva, Vienna and Brioni, it was not all hard grind. There were official and unofficial OPEC parties, excursions to the surrounding countryside, gastronomic “treats”, a box at the Vienna Opera and the activities of the OPEC POETS, who, led by the voluminous Oil Minister of the UAE, strove, in their leisure time together, to reduce the proceedings and almost anything else they could think of, to light verse.*

*Tempest had had some oblique experience of OPEC more or less from its foundation in 1960/61 when he had been working in the Bank of England on the management of the Kuwait external reserves and later in Doha, Qatar in 1970-71 as General Manager of the currency authority covering seven of the Emirates of the Lower Gulf. In 1973/6 he was Secretary of the Bank of England's Special Oil Committee, which, under the Chairmanship of Sir Kit McMahon, handled several difficult oil-related issues, including the impact of the new oil surpluses on the London euro-dollar market and on the London banks, recycling mechanisms in the industrialised world, debt and trade impacts at home and elsewhere as well as specific infrastructure problems which emerged in Saudi Arabia and among the OPEC producers.*

*In 1990, OPEC published, in its 30<sup>th</sup> Anniversary Bulletin, his “OPEC – A View from the Deck” on the past, present and future of OPEC. The theme was continued in articles by him in the *Oil and Gas Journal*, *Energy Policy*, the *Geopolitics of Energy* and the *IAEE Newsletter* and in “*The Politics of Middle East Oil*” (Graham and Trotman, London, 1993) which he introduced and edited with chapters by Grigor Bondarevsky, Kunio and Motoko Katakura, Hermann Eilts, Melvin Conant, Sir John Moberly, Malcolm Mackintosh, Jean-Pierre Audoux, Ian Skeet, John Devlin and Murray Gart, all members of the Royaumont Group (1985-93) and including a special contribution from Ahmed Zaki Yamani.*

\*Paul Tempest is Vice-President of the British Institute of Energy Economics and the Executive Director of the Windsor Energy Group. He is a past president of the IAEE. e-mail: tempest@greenwich40.co.uk This article is adapted from a luncheon address to the American-European Community Association and a one-day Shell Group Seminar, both in February 2002.

### Introduction

OPEC has recently again come into the focus of public attention. Energy economists world-wide are again modelling its probable and possible responses to a weak market. Can OPEC again save the day?

OPEC has never been a transparent organization, operating always discreetly behind closed doors. In the United States, it is still quite widely and frequently demonized as the disruptive secretive cartel which out-witted the rest of the world in the seventies and twice imposed very high oil prices on the global economy at the cost of major economic slowdown world-wide, a global banking and international debt crisis and levels of inflation which threatened to destroy many economies in the developing world. Yet OPEC changed its stance in the eighties and its opacity now may be seen as a virtue.

This paper is intended as a short briefing for the newcomer on the politics of OPEC, an essential prelude to any energy economics prediction exercise. It identifies the key characteristics of OPEC as it has evolved since its foundation. It examines OPEC's current weaknesses and strengths and concludes with ten guidelines and constraints indicating how, over the next few years, within its limited scope, OPEC is likely to try to strengthen its position in the global oil market and how it is likely to respond to imbalances of oil supply and demand whenever they occur.

### OPEC - A Political Survivor

My first point about OPEC is that it is essentially driven by political input and often has to struggle hard to reconcile its decisions by the use of economic logic and market common-sense. The fact that it is still with us, forty-one years after its foundation in Baghdad on 10-14 September 1960 demonstrates that OPEC is a determined and skilful survivor. It can only survive by performing a function which serves the needs and demands of its members and it can only achieve their common objectives without radically alienating the major oil consumer countries or without posing any sort of threat to global economic stability. To the surprise of many, OPEC has turned into a significant international organisation acceptable to the West.

Remember that OPEC's origin was essentially diplomatic, a producer government response to short-sighted posturing by the leading companies and to the connivance or hostility of the leading consumer countries. A joint meeting of Arab Governments in Cairo in 1958 had declared that the price of Middle East crude oil, as set by the major companies, should not be reduced without prior consultation with Middle East governments. Ignoring this in 1960, the U.S. companies with the full support of Shell, BP and CFP cut the price. The formation of OPEC was a direct retaliation to this act.

### OPEC Objectives

The objectives of OPEC are defined in four fundamental points in its charter documentation:

- to co-ordinate and unify petroleum policies among member countries,
- to secure fair and stable prices for petroleum producers,
- to ensure an efficient, economic and regular supply of petroleum to consuming nations, and

- to ensure a fair return on capital to those investing in the industry.

There have been many quibbles over the years on what is meant by a fair price and a fair return, but by and large the original definition of objectives has served OPEC well. They have not needed amendment and they still look today appropriate to current needs and as good a basis as one could ask for over the next few years.

### **OPEC Membership and Leadership**

The five founding members – Iran, Iraq, Kuwait, Saudi Arabia and Venezuela have today six other full members with them: Qatar (from 1961); Indonesia (1962); Libya (1962); United Arab Emirates (1973, from Abu Dhabi joining in 1967); Algeria (1969) and Nigeria (1971). Ecuador joined in 1973 and left in 1992 and Gabon joined in 1975 and left in 1995.

So the leading members have stuck together firmly even under very difficult circumstances. Take the Iraqi occupation of Kuwait in 1990-91 when over 1,000 young Kuwaitis disappeared into Iraq and where over 600 are still thought to be held prisoner there: almost every family in Kuwait has lost someone. Or the Iran/Iraq War of 1980-88 when - for eight years despite half a generation of young men killed, wounded, or listed as missing - Iran and Iraq sat regularly side-by-side at the OPEC meetings. Over the last forty years, several leading members including Iran, Nigeria and Indonesia have experienced major revolutions or civil war, yet they have still hung on to their OPEC membership.

There is no quibble about OPEC leadership. Originally conceived between Saudi Arabia and Venezuela, and, until 1979, shared fairly evenly between Saudi Arabia and Iran, OPEC is now firmly in the hands of the single giant in terms of global oil-exporting, reserves and production, Saudi Arabia. Moreover today Saudi Arabia can still generally rely on the support of three partners in the Gulf Co-operation Council, namely Kuwait, Qatar and UAE and requires therefore the support of only two other members to achieve a simple majority among the total membership. On some purely Gulf issues, two other Gulf members, Iran and Iraq can be expected to support the Saudis, giving a simple majority without recourse to members outside the Gulf. Decisions are almost never taken simply on a majority vote and every effort is made to achieve unanimity. Nonetheless, this weighting in favour of the Gulf states is central to the process of OPEC decision-making and is reflected in the fact that each member delegation has more or less equal space around the conference table.

The non-Gulf members have most certainly contributed a great deal to OPEC's credibility and influence, extending the membership spread to Latin America, South East Asia, North Africa and West Africa, and giving a non-regional character and non-factional face to OPEC. In this respect the membership of Venezuela most usefully bridges the gap between Islam and Christianity and between the Americas and the rest of the world. The diplomatic route from Washington, DC to Riyadh and on to OPEC's Headquarters in Vienna often still includes a stopover in Caracas while that from Europe has been known to pass from time to time through Algiers and from Japan via Jakarta .

OPEC, in 1986-88 and quite recently, has made strenuous efforts to extend its membership, most notably to

Norway, Russia and Mexico as well as to half-a-dozen other smaller oil exporters. So far this has been without success, other than to secure some promises of production cuts to help enhance prices. Most significant of these was the recent (rather rash) Russian promise to cut production by 150,000 bd to match a Saudi commitment to cut Saudi production by 462,000 bd to a new quota of 7,053,000 bd.

### **The Management of OPEC**

There are only two outstanding names in the history of OPEC:

- Sheikh Ahmed Zaki Yamani, Saudi Oil Minister (1962-86) who master-minded the oil-price confrontations of 1973/4 and 1979/80 and who, after 1979, ensured that OPEC provided a convenient political screen and endorsement for policies dictated essentially by the wishes of Saudi Arabia;
- Dr Subroto, Indonesian Oil Minister and through the late 80's Secretary-General of OPEC who is credited with securing the transformation of OPEC into an institution in lively contact with the consuming and importing countries and no longer in apparent conflict with the generally agreed global economic objectives of securing high economic growth, low inflation and, particularly, stable energy prices.

### **'The OPEC Camel'**

Since then, OPEC has continued to function with all the characteristics of a rather disparate committee charged with preserving the status quo - a discreet defensive screen to protect the interests of its lead-member. Much smoke and chat, but not a lot of effective action. Saudi Arabia, in turn has proved responsive to prompting by the United States and other leading industrial countries both to increase production to moderate oil prices and, within a few months, to cut production to underpin them. Meanwhile, therefore, the 'OPEC Camel' has been encouraged to plod on stolidly up-hill and down through mainly waterless desert and occasional sandstorms.

Through the nineties to the present, OPEC has indeed performed a delicate and painful balancing act to try to stabilise the oil market. It has been a delicate task, in that world events and politics delivered forces and pressures far beyond OPEC's experience and competence hitherto. The process was also extremely painful in the periods when OPEC market share declined sharply and whenever, over long periods, oil prices registered a decline in real terms resulting in much reduced oil income and purchasing power for all members and a savage curtailment of investment and government spending.

Nonetheless, since April 1999, OPEC Ministers have met frequently to tweak the system by repeated adjustments to production ceilings and, as much by luck and external circumstance as by good management, they have taken most of the credit of keeping prices close to the lower target of their range. By focussing on an aggregate number with quotas adjusted in strict pro rata proportions, they have side-stepped the damaging in-fighting among members which characterised some of the earlier debates within OPEC. Old grudges, however, remain below the surface and are bound, sooner or later, to reappear. This is one aspect of OPEC's underlying preference to avoid outright confrontation between members.

*(continued on page 14)*

## OPEC, The Opaque (continued from page 13)

OPEC's treatment of Iraq, for example, can only be described as 'a benign tolerance' of the black sheep in the OPEC family.

Outside observers are quick to point out that agreed quotas are rarely adhered to, the degree of 'cheating' rising sharply, whenever the market comes under pressure. Nonetheless, the semblance of concerted action is often enough to steady a runaway market and that, supported by a strong lead from Saudi Arabia, has proved a most valuable regulatory mechanism in an otherwise volatile global market.

### 'A Thorn in the Eye'

As I have emphasised, there is nearly always a strong political dimension in the deliberations and decisions of OPEC.

OPEC will be "a thorn in the eyes of those who deviate from the right path" declared General Kassim, President of Iraq on the foundation of OPEC. Mercifully, the outright political struggles of the Middle East leading to the oil-price discontinuities of 1973/4, did not result in the "OPEC oil-weapon" being developed to serve only Middle East political interests. Indeed OPEC set a model for many other international organisations, demonstrating reasoned and informed judgment and sensitivity to the needs of the global community.

### Leverage in the World Oil Market

Despite the lead-position of Saudi Arabia, OPEC does still derive great strength from an internal balance of interest, most notably between Saudi Arabia and the other Gulf states. Note, for example, that Saudi Arabia's lead-share of proven global oil reserves (25%) is more than matched by the combined share of the other Gulf states together (39.2%). Similarly, while Saudi Arabia heads the list in its 12.3% share of global oil production, the other Gulf states together count for more (15.9%). Outside the Gulf the only OPEC member with weight is Venezuela with 7.3% of reserves and 4.6% of global oil production.

**Table 1**  
**Global Oil Market Share of OPEC**

	Proven Reserves End-2000 %	Production Year-2000 %	P/R Ratio Years
<b>OPEC Gulf</b>			
Saudi Arabia	25.0	12.3	81.1
Iran	8.6	5.2	65.7
Iraq	10.8	3.6	>100
Kuwait	9.2	2.9	>100
UAE	9.3	3.2	>100
Qatar	1.3	1.0	47.1
Total OPEC Gulf	64.2%	28.2%	-
<b>OPEC North Africa</b>			
Libya	2.8	2.0	55.3
Algeria	0.9	1.9	17.4
<b>Other OPEC</b>			
Venezuela	7.3	4.6	66.4
Nigeria	2.2	2.9	29.4
Indonesia	0.5	1.9	17.4
Total OPEC	77.8%	41.5%	74.3yrs

The five largest of the Gulf producers have very substantial reserve/production ratios – Iraq, Kuwait and UAE have over 100 years. Saudi Arabia's official ratio of over 80 could probably be doubled and Iran's reserves will last at least 65 years. Compare these ratios with those for the United States (10 years), Russia (20 years) and China (20 years).

**Table 2**  
**Global Oil Market Share of Non-OPEC**

	Proven Reserves End-2000 %	Production Year-2000 %	P/R Ratio Years
Russia	4.6	9.0	20.6
USA	2.8	9.8	10.4
China	2.3	4.5	20.2
Other	12.5	35.2	-
Total Non-OPEC	22.2%	58.5%	13.4years

The P/R Ratio is the Total Proved Reserves of a state or grouping of states at the end of a year divided by the Total Production in the preceding twelve months.

Source: BP Annual Statistical Review of World Energy, June 2001.

### Why The Middle East Dominates the Oil Market

If we ignore the volumes of oil production which are consumed in the country of origin and not exported, we can begin to see how dominant the Middle East is in the world oil market with over 50% of world oil exports of crude and almost 25% of global product exports.

**Table 3**  
**Global Oil Exports in 2000**

	Crude Exports	Product Exports	Mbd Total
From Middle East	16.7	2.2	18.9
Global Total	33.3	9.1	42.7

The term Middle East covers the states of the Arabian Peninsula, plus Iran, Iraq, Israel, Jordan, Lebanon and Syria

Source: Oil and Gas Journal.

### Idle Capacity

Non-OPEC oil producing countries maintain almost no idle oil production capacity and, given the profit and revenue pressures of the market, are unlikely ever to do so. Even within OPEC, idle production capacity is not evenly shared, with Saudi Arabia accounting for well over 50% of the total spare capacity of OPEC. The majority of OPEC states most of the time produce flat out at full capacity, whatever their quota commitments to OPEC. Compliance with OPEC is therefore rarely 100% and then often the result of external circumstance rather than specific action by government.

Day-to-day oil production and capacity data of most OPEC members are considered by their governments as 'political' and are shrouded in secrecy: the industry have to rely mainly on their own sources and are often reluctant to disclose market-sensitive information from which they derive commercial benefit.

Reliable estimates put OPEC total spare capacity at 4.1 – 7.1 mbd in mid 2001 and the number took an upward jump in September 2001 as OPEC was obliged to absorb the



downswing in global oil demand, following the atrocities in New York. This surplus OPEC capacity is widely expected to reach at least 10 mbd by 2010 unless the global economy can shake itself back into a high-growth trajectory. In this, together with a probable decline in global market share, lies OPEC's greatest weakness over the next few years ahead. Nonetheless, there are also some new strengths.

### **Current Strengths**

OPEC perceives today that it has a window of diplomatic and economic opportunity. Overall surplus capacity is small relative to the eighties and to the apparent prospects for the coming decade. It is now in a pro-active stance in the market, compared to its re-active stance in the past. It carries a new weight in the tacit acknowledgement of the United States that its actions are likely to be stabilising and not destabilising factors in the world economy. Its \$22-28 oil-price target has been widely recognised as a helpful and reasonable range within the market capacity of consumers to pay and adequate for the oil industry to secure the financing of perceived levels of investment needed in the industry over the next decade. At a political level, the increased vulnerability of Saudi Arabia to terrorism from within or without the Kingdom enhances the role of OPEC as a screen and channel.

### **OPEC And Global Terrorism**

As we have outlined in this paper, OPEC's fundamental interest is inextricably linked to a secure and stable pattern of demand and price for the oil exports of its members. This offers the best option in terms of continuing regularity in the flow of hard-currency oil revenue for each of its members. Disruption of supply as envisaged in the political embargos on the ultimate destination of OPEC oil in the Middle East crisis of 1973/4, which at that time was very widely interpreted as a form of global economic terrorism, is almost inconceivable today. OPEC's part in any renewed holding of the global economy to ransom would today impose immense strain on the cohesion of OPEC and would invite massive and crippling retaliation.

It is worth remembering that, at a personal level, not very long after the oil-price discontinuities of 1973/4, the OPEC Ministers came face-to-face in the following year with the realities of global terrorism. The seizing and kidnap of the leading OPEC Ministers by the Carlos Gang in Vienna in December 1975 had an essentially political motive, not merely one driven by the attempts of a few individuals to extract a huge ransom. It brought home to Yamani and Amuzegar, the Saudi and Iranian Oil Ministers who, at that time over several days, were repeatedly threatened with immediate execution, how extremely dangerous was the game they were playing. Today, there is absolutely no doubt that none of the current oil ministers or their political masters would wish to see similar forces marshalled against them again.

As currents of political unrest begin again to unsettle the Middle East states and are increasingly fed by new internal and external questioning of the legitimacy of the OPEC regimes, OPEC governments can be expected to proceed with caution. High unemployment, under-employment and mis-employment of a large restless new generation with high expectations focuses public attention on the current allocation pattern of oil and gas revenues, OPEC's future will, there-

fore, be closely linked to the fundamental if muted desire of OPEC governments to ensure the maintenance of law and order, the preservation of a stable economic and political infrastructure and the suppression of global and any other brand of terrorism.

### **Ten Guidelines for Current OPEC Strategy**

In the light of the above analysis, what assumptions can we make to outline OPEC's likely strategy and market intervention over the next few years?

1. OPEC membership is likely to hold together with few defections or newcomers.
2. OPEC leadership will remain with Saudi Arabia. This may in fact be enhanced by the current Saudi rapprochement with Iran or tend to be eroded by further evidence of private Saudi financing of global terrorism or renewed internal feuding within the Saudi royal family.
3. Iraq's membership will continue to be held "at arm's length".
4. Saudi Arabia will continue to enjoy close and loyal support within OPEC from Kuwait, Qatar and the UAE.
5. Iran and Iraq will continue to pose problems in political terms, particularly if the United States persists with its overt policy of branding and linking Iran and Iraq (an "axis of evil") as possible targets for intervention .
6. OPEC will continue to try to stabilise the oil price by cutting or expanding agreed production quotas on a pro rata basis whenever prompted by Saudi Arabia, which in turn will continue to rely on the advice given to it by the United States.
7. Pandora's Box - while promising to do so, OPEC will refrain from any general renegotiation of country quotas, however out of line some of them become. It may attempt, half-heartedly, negotiations with one or two members on a bilateral basis.
8. OPEC is unlikely on its own to generate any extreme direct price confrontation with the consumers.
9. OPEC and its Ministers will continue for the time being to enjoy the tacit support of the EU, United States and Japan.
10. This cosy, tacit relationship could be rapidly overturned if there were any major upheavals in Saudi Arabia, if Iraq-Israel-Palestine relations deteriorated into outright war or if Iran changed track and sought to divert increasing unrest at home into confrontation with Saudi Arabia and the Gulf Emirates.

In summary, the future survival of OPEC is directly related to the need to resolve or neutralise current and future major conflicts in the Middle East. Meanwhile OPEC performs a valuable role in the global economy both as an economic regulator and as a discreet intermediary and channel of communication.

**IA**  

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## **Do Deepwater Activities Create Different Economic Impacts to Communities Surrounding the Gulf OCS?**

*By Williams O. Olatubi and David E. Dismukes\**

### **Introduction**

According to the Mineral Management Service (MMS), the Gulf of Mexico Outer Continental Shelf (OCS) region accounts for more than a billion offshore acres and collects about \$6 billion in mineral revenues annually. The region produces a substantial amount of oil consumed in the United States and about 97 percent of gas production in the country. This large influence does not go unnoticed to the regional economies surrounding the Gulf.

It is, therefore, not surprising that the economic impact of offshore activities has become an increasingly important issue to the MMS. A very large portion of MMS research focus is subsumed within the agency's Environmental Studies Program (ESP) and defined in its National Strategic Plan (NSP).

The socioeconomic studies component of the program includes the following objectives:

- Provides information essential to understanding the consequences of OCS-related activities for the populations, economies, and social and cultural systems in areas where the activities occur;
- Supports the MMS's planning and management processes; and
- Provides information essential for effective interaction with the public about the effects of OCS activities.<sup>1</sup>

The MMS' primary legal mandate to analyze the socio-economic impacts of natural resource management issues is provided in both the Outer Continental Shelf Lands Act, as amended in 1978 (OCSLAA), and the National Environmental Policy Act of 1969 (NEPA). NEPA requires federal agencies engaged in significant land actions to assess impacts, including those on the human environment, through the process of conducting Environmental Impact Statements (EIS).<sup>2</sup>

Over the past several years, the ESP has become increasingly more engaged in the socioeconomic research of coastal communities in support of its EIS mission. Of the three major MMS regions (Alaska, Pacific, and Gulf of Mexico), the Gulf of Mexico would appear to have a pressing need for continued socioeconomic impact analyses. The Gulf, in addition to providing a significant number of reserves and production, is also undergoing unique developments in both deepwater activity (900 meters and above) and the potential development of frontier areas in the eastern Gulf off the coast of Florida.

As early as the mid-1980s, the MMS Gulf of Mexico region began its efforts to model the implications that offshore development had on coastal communities. For close to 10 years, however, a good portion of these regional

modeling initiatives focused more on past consequences of outer continental shelf (OCS) oil and gas development than on predictive methods. This focus is changing and MMS has been supporting and encouraging a more general equilibrium model of the economic impacts of oil and gas development with some predictive abilities.

Section 18 of the OCS Lands Act requires that the Secretary of the Interior prepare, and periodically revise and maintain, a 5-year schedule of lease sales (Five-Year Program). Section 18 also requires that, in deciding whether to approve a new Five-Year program, the Secretary must consider, among other things, "an equitable sharing of development benefits and environmental risks among the various regions." A key consideration in this regard will be an adequate and fair assessment of the economic effect of the leasing activities as oil and gas development follows.

The important analyses for MMS in both its equitable sharing plan and EIS analyses, is not limited to just the direct effects resulting from the spending by the companies working directly on an OCS project. The analysis is also dependent on examining the potential differential economic effects those activities may have on communities depending on how far or near from shore those activities takes place.

More recently, the MMS has examined the economic impact of some coastal communities of oil and gas development activities in the OCS. However, most of these studies have focused on the overall impact on a broad level. Increasingly, due to technological innovations and resource depletion close to the shore, more industry activities are beginning to concentrate in deep waters in the OCS. As pointed out earlier, there are potentially significant differences in the impacts associated with these deepwater activities that could lead to differential impacts on a community's economy – offsetting the equity goals established for MMS by statute.

This paper is a very condensed version of a larger study sponsored by the MMS that examines three fundamental issues for estimating regional economic impacts associated with offshore activities: developing unit costs for each activity; developing expenditure profiles (production functions) for each offshore activity; and developing onshore allocations for the economic impacts associated with each activity. This paper concentrates on the overall methods used to develop these drivers of economic activity. We conclude with an examination of the relative differences between shallow water and deep water for one type of offshore activity: exploratory drilling.

### **Modelling Issues**

Economic impact models that are developed specifically for OCS oil and gas development analyses must be customized to reflect the unique expenditure patterns of OCS-related companies and their employees in order to properly estimate indirect and induced effects. These activities differ from standard onshore oil and gas activities and require a different set of economic drivers to develop a complete economic impact model.

For example, OCS activities require much larger purchases of catering services, disposal services, transport services, and communications services than do onshore activities. In addition, these impacts may vary by how far offshore the development is located. Furthermore, these models will need to be customized to reflect the location of

\* Williams O. Olatubi and David E. Dismuke are with the Center for Energy Studies, Louisiana State University. This is an edited version of their paper presented at the 24th Annual IAEE Conference in Houston, TX, April 25-27, 2001.

<sup>1</sup> See footnotes at end of text.



more specialized activities that may not be common across the entire Gulf region. Customization is necessary because ready-made models such as IMPLAN are calibrated on national production functions, which may not accurately mirror local realities.

There are a number of methodological issues associated with modeling something as complicated and multifaceted as the offshore oil and gas industry. Our research goal has not been to address each and every methodological issue, but concentrate on four of the more important issues that were identified by MMS.

#### **Defining Offshore Expenditure Profiles**

The exploration, development, and operation of offshore leases is a considerable logistic challenge. These challenges are often revealed in the types of expenditures that are made by offshore operators. Thus, the first step in the analysis of offshore activities is to define a relevant set of expenditures, taking into account many of the unique expenditures that are required for this special aspect of the oil and gas industry. Some of the expenditure categories that have unique implications for offshore activities include: water and air transportation, food and catering services, water supply, waste disposal, turbines and fuel, and communications, instrumentation and SCADA system.

#### **Defining Offshore Activity Phases**

Another important area of examination is defining the relevant phases of offshore activity. Most IO models, as well as National Income and Product Accounts (NIPA), treat oil and gas activities as a highly aggregated activity. In these accounts, and the models utilizing them, onshore and offshore activities are rarely separated, and even then, are aggregated into either drilling or production activities. MMS, however, must consider a range of offshore oil and gas activities over relatively long periods of time in the EIS

evaluation. The activities that were defined by MMS as being important for socioeconomic modeling purposes include: exploratory drilling; development drilling; platform fabrication and installation; pipeline fabrication and installation; gas processing facility installation; production; workovers; oil spills; and platform removal and abandonment. For typical EIS analyses, socioeconomic analyses will begin with a forecast of activities (in units) for each of the above activity phases.

#### **Defining the Onshore Allocation of Offshore Activities**

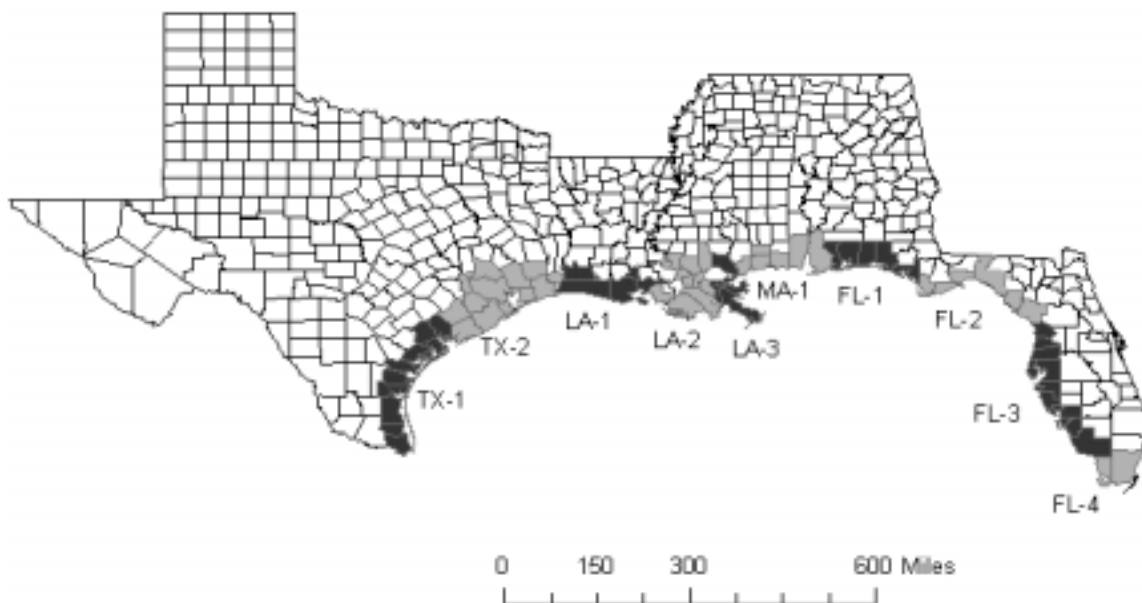
The allocation of expenditures to onshore areas is probably one of the more important factors for determining the region-specific economic impacts associated with offshore activities. These break-outs are important because there are tendencies for certain onshore support activities to be concentrated in particular geographic areas. This concentration has tended to occur in Louisiana and Texas, and has continued despite the movement of offshore activities into deeper water and into the Central-Eastern portions of the Gulf of Mexico.

#### **Defining Relevant Water Depths**

Another methodological challenge rests with modeling variations in expenditure profiles across water depths. For instance, should, or do, expenditure profiles change as offshore activities move into deeper waters? Conventional wisdom would tend to support the hypothesis that there is a positive, and probably close to linear, relationship between certain relative costs and water depth. Water transportation costs comes to mind, as being a relative cost that should increase as water depth, and hence distance, increases. However, the unique realities of offshore activities, coupled with inconsistencies in data collection and (internal) report-

*(continued on page 18)*

**Figure 1**  
**MMS Gulf of Mexico Coastal Areas**



## **Deepwater Activities** (continued from page 17)

ing, can lead to significant challenges in what should appear to be an obvious conclusion.

These issues must be addressed within the context of the geographical areas that have been identified by the MMS, and that forms the basis of its planning program in the Gulf. These areas are depicted in Figure 1. Distinct water depths that have been defined by MMS within the context of their planning programs in the Gulf include: 0-60 meters; 60-200 meters; 200-900 meters; and 900 meters and above

The above distinct geographical delineation and water depths are crucial to accurately estimating the levels of spending by activity, location, and to relevant communities in the Gulf coast.

For a specific modeling approach we rely on the Input-output (IO) approach using IMPLAN (Impact Analysis for Planning).<sup>3</sup> A shortcoming with most IO analysis is that the impact drivers (or multipliers) in the model are typically taken from national, as opposed to regional trends and industries. Such an approach assumes, among other things, that industries in any given area will use inputs in the same proportion as the national average.

For oil and gas firms operating in the Gulf OCS, this assumes that input expenditures are made in the same proportion as the national oil and gas industry average. Not only does such an approach assume regional similarities, but it also assumes that onshore and offshore production functions are similar. It is this last problem that causes the most difficulty in using existing regional IO models based on IMPLAN to examine the economic impacts of offshore activities. Because of this and the peculiar nature of this industry, unique methodological and data collection approaches can help remedy this potential problem. By supplementing IMPLAN data with other existing regional data, a more accurate picture of the economy is presented in what is called a hybrid model.<sup>4</sup>

### **Data and Methods**

Data needs of oil and gas development impact analysis are very extensive. Two data collection issues are particularly important:

1. How to identify, locate, and secure reliable sources of information that did not require the use of survey instruments; and
2. How to reconcile accounting classifications to economic classifications.

The first issue was the more problematic of the two and one that plagues ongoing MMS social science research. Our research needed to find a way to collect information that did not use survey or survey-type instruments. Therefore, mailing questionnaires to numerous companies operating offshore was not allowed.<sup>5</sup> Alternatively, relevant data was compiled from a variety of different sources. In general, these sources include government, industry, trade, and academic publications, periodicals, and databases. Some of these publications were readily available and straightforward. For instance, there is considerable information on drilling expenditures and patterns from the *Joint Association Survey of the U.S. Oil and Gas Producing Industry* compiled annually and published (jointly) by the American Petroleum Institute (API), the Independent Petroleum Association of

America (IPAA), and the Mid-Continent Oil and Gas Association. Likewise, there is considerable information on pipeline construction costs and expenditures that are filed regularly before the Federal Energy Regulatory Commission (FERC).

For data that are not readily available from these direct "secondary" sources, we rely on industry or trade association information and surveys previously (and independently) compiled. Because of potential bias, these requests were limited, however, and were simply used to "fill-in-the-blanks."

The additional data issue was taking disparate documents and information, most of which were provided in accounting-based formats, and translating them into economic information for modeling purposes. Accounting information, for instance, rarely makes distinctions between fixed and variable costs or clear-cut differentiations between capital and labor. Thus, a process of reviewing accounting information on a line-by-line basis was required. To be consistent with economic principle judgment calls are sometimes necessary.

In some cases judgment calls have to be made with regard to expenditure classification. For example, the process of making judgment calls on some classifications was most apparent in dealing with contracted services. Many costs associated with offshore activities would appear as contracted services from one firm to another, although both were engaged in the same activity. For instance, a company developing an exploratory well(s) would often, particularly in shallow water, contract drilling services out to a separate company. This company, in turn, would have direct expenditures for labor, materials, equipment, and other items that would "escape" our data collection ability. This has led to slight biases (overstatements) in general categories such as IMPLAN sector 38 (oil and gas operations) or 57 (other oil and gas field services).

### **Relative Differences in Shallow versus Deepwater Activities**

Using these expenditure profile drivers to model economic impacts show that, in general, deepwater development impact is at least 1.4 times as great as those of shallow waters considering overall total effects. Unfortunately, space limitations for this paper do not allow us to examine total economic impacts associated with our deep and shallow water models. Nevertheless, this order of magnitude difference should be of no surprise to anyone associated with offshore development and operations. Clearly the scope and scale of deep-water activities is considerable relative to its shallow water counterpart.

What is of importance, however, is the relative differences in the expenditure patterns for deepwater activities relative to shallow water. One question that can be raised is whether deepwater is just a more "massive version" of shallow water (i.e., large total impacts, few relative differences). As can be seen in Table 1, this does not appear to be the case. This table presents the estimated differences in expenditure profiles for exploratory drilling in both shallow water (0-60 meters) and deep water (900 and above).

### **Summary and Conclusions**

The process of trying to create real world models for offshore oil and gas activities in the Gulf of Mexico can yield meaningful difference from just standard "canned" approaches contained in generalized IO models. The MMS motivation for moving forward with creating these custom-

**Table 1**  
**Relative Differences in Exploratory Drilling Expenditures by Water Depth<sup>6</sup>**

		Average Production Function 0-60 Meters	Average Production Function 60-200 Meters	Average Production Function 200-900 Meters	Average Production Function 900+ Meters	Total Average Production Function All Depths
38	Oil & Gas Operations	0.6773	0.6741	0.7331	0.7322	0.7042
57	Other Oil & Gas Field Svcs	0.0343	0.0342	0.0292	0.0292	0.0317
210	Petroleum Fuels	0.0283	0.0283	0.0242	0.0241	0.0262
232	Hydraulic Cement	0.0669	0.0695	0.0580	0.0593	0.0634
258	Steel Pipe and Tubes	0.0619	0.0628	0.0441	0.0438	0.0531
403	Instrumentation	0.0408	0.0407	0.0346	0.0346	0.0377
436	Water Transport	0.0828	0.0827	0.0701	0.0701	0.0764
437	Air Transport	0.0078	0.0078	0.0066	0.0066	0.0072
	<b>Total</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>	<b>1.0000</b>

ized approaches appears to be justified. Table 2 presents a summary of the IMPLAN output for the LA-2 region identified in Figure 1. Two columns have been provided that present the economic output from shocking both the generalized IMPLAN model and the IMPLAN model using our specialized expenditure profiles and onshore allocations.

The differences in output, for instance, are 8 percent lower using our revised method of measuring economic impacts, than the canned approach included in IMPLAN. Labor income, however, is about 42 percent higher in our analysis relative to standard approaches. Value added is 14 percent higher in our model, while employment opportunities, represented by the number of jobs created by new

exploratory wells, is 62 percent higher in our model than the standardized approach. These results, at minimum, support the notion that there are unique economic differences in the offshore industry and that further research should be conducted to better understanding those differences and the impacts they have on human communities of the Gulf of Mexico.

**Footnotes**

<sup>1</sup> LTG Associates, Inc. 2000. *Report on the 1999 Minerals Management Service Social and Economic Studies Conference*. OCS Study MMS 2000-016. Department of the Interior Minerals

*(continued on page 20)*

**Table 2**  
**Estimated Economic Impacts for Exploratory Drilling, LA-2 Region**

*Estimated Annual Impact -- Standard Analysis (1998 Dollars)*

	Direct	Indirect	Induced	Total
Output	179,502,016	16,454,092	15,543,905	211,500,011
Labor Income	14,524,824	3,839,397	5,936,279	24,300,500
Total Value Added	49,131,317	8,382,280	9,560,596	67,074,189
Employment (Number)	273	111	246	629

*Estimated Annual Impact -- Modified, Gulf-Specific Analysis (1998 Dollars)*

	Direct	Indirect	Induced	Total
Output	178,219,407	29,111,563	21,800,854	229,131,826
Labor Income	17,490,114	8,875,273	8,325,832	34,691,221
Total Value Added	47,687,687	15,538,328	13,409,060	76,635,075
Employment (Number)	391	278	345	1,014

### **Deepwater Activities** (continued from page 19)

Management Service, Environmental Studies Program: 4

<sup>2</sup> U.S. Department of the Interior, Minerals Management Service, 1996. *Outer Continental Shelf Oil & Gas Leasing Program: 1997-2002: Final Environmental Impact Statement*. Washington, D.C.: U.S. Department of the Interior, August:1-1

<sup>3</sup> IMPLAN is one of the ready-made input-output databases for impact analysis. Originally developed by the U.S. forest service, it has become one of the most utilized approaches to modeling economic impacts of projects in the U.S. It is underlined by a demand-driven general model of an economy, assuming fixed prices and no resource constraints.

<sup>4</sup> Of course, there are other ways to collect IO data. One is to use surveys, however, these are prohibitively expensive for a large region, and as a consequence, are rarely used.

<sup>5</sup> This restriction on data collection is placed on MMS by the Paper Work Reduction Act of 1980, and reauthorized in 1995.

<sup>6</sup> Only the relevant sectors identified in our analysis are presented in this table.

### **Aberdeen Program** (continued from page 5)

#### **Queries: (excluding Social Tours)      Social Tours:**

Professor Alex Kemp	Pam Wells
Department of Economics	Corporate Events
University of Aberdeen	Gowanbank
Edward Wright Building	Station Road South
Dunbar Street, Old Aberdeen	Peterculter
AB24 3QY Scotland, UK	Aberdeen
Phone: +44 (0) 1224-272168	AB14 0LL Scotland, UK
Fax: +44 (0) 1224-272181	Phn/Fax:+44(0)1224-735733
Email: <a href="mailto:a.g.kemp@abdn.ac.uk">a.g.kemp@abdn.ac.uk</a>	<a href="mailto:wells@compuserve.com">wells@compuserve.com</a>

**\*\* CONFERENCE SPONSORS TO-DATE:** Shell, BP, UK Department of Trade and Industry, Aberdeen City Council, Scottish Power, Conoco, TotalFinaElf, Ernst & Young.

### **Sam Schurr**

Sam Schurr, one of Resources for the Future's leading scholars and a pioneer in energy and mineral economics, died peacefully in his sleep on March 4 from cardiac arrest. He was 83.

"Though it's been a long time since Sam Schurr served on the research staff at RFF, his impact is felt every day," says RFF President Paul Portney. "Not only was he a leading light in the fields of energy and minerals economics, but he helped establish the tradition here of even-handed and empirically grounded policy analysis."

Schurr joined RFF in 1954, where he was among the first to focus on the role of energy in economic activity. He gained national recognition in 1960 for the groundbreaking work, *Energy in the American Economy*, which he co-authored with the late Bruce Netschert. The book provided an exhaustive account of the production and consumption of U.S. energy from the mid-19th century, along with an assessment of future energy-use trends several decades into the future.

Together with another RFF luminary, the late Hans Landsberg, he co-authored the 1968 book *Energy in the United States: Sources, Uses, and Policy Issues*. He is also well known for co-authoring *Energy in America's Future: The Choices Before Us* (1979).

Joel Darmstadter, RFF senior fellow and a frequent collaborator with Schurr, notes, "it is easy to forget just how fundamental the collective collaboration of Schurr, Netschert, and Landsberg was to gaining insight into the pivotal importance of fuels and power as part of technological progress and economic growth.

"Few economic historians and energy analysts - in the private sector or in government - have failed to exploit *Energy In The American Economy* and other such works to inform their own research," says Darmstadter.

Schurr was born in 1918 in Youngstown, Ohio, and moved to New Jersey as a youth. After earning degrees at Rutgers and Columbia Universities, Schurr began his professional career in 1939 at the National Bureau of Economic Research. During World War II, he worked as a research economist for the Office of Strategic Services (Europe-Africa division), and later with the U.S. State Department commission on German reparations. In 1950, he joined the U.S. Department of the Interior's Bureau of Mines, where he worked as chief economist until 1953. After a year as chief of the economics division at Rand Corporation, he joined RFF in 1954 as director of the independent research institute's energy and mineral resources program. He continued at RFF until 1973, when he became the director of the energy systems, environment, and conservation division at the Electric Power Research Institute (EPRI) in Palo Alto, CA. He rejoined RFF as a senior fellow and co-director of its Center for Energy Policy Research in 1976, before once more joining EPRI as the deputy director of its Energy Study Center. He retired in 1989, but continued as a consultant to the institute.

Throughout his professional career, Schurr served on a number of distinguished advisory panels for the National Academy of Sciences and the Federal Power Commission, among others. He also was a member of the President's Task Force on Natural Resources (1965), a consultant to the International Monetary Fund on international oil problems (1970), and a member of the international editorial board of *Energy Policy*.

The American Institute of Mining, Metallurgical and Petroleum Engineers honored Schurr with its 'Mineral Economics Award' in 1968. He also received a special award for his contributions to the literature of energy economics and for service to his profession by the International Association of Energy Economists (IAEE) in 1981. He also served as IAEE President (1978-79).

He was married for 50 years to Beatrice Gray Schurr until her death in 1992. He leaves his second wife, Sally N. Schurr, and his many friends and colleagues who enjoyed his intellectual insights and wisdom, and who share this loss.

!!! MARK YOUR CALENDARS — PLAN TO ATTEND !!!

## ***Energy Markets in Turmoil: Making Sense Of It All***

22<sup>nd</sup> USAEE/IAEE Annual North American Conference – October 6-8, 2002  
Vancouver, British Columbia, Canada – Sheraton Wall Centre Hotel

We are pleased to announce the 22<sup>nd</sup> Annual North American Conference of the USAEE/IAEE, ***Energy Markets in Turmoil: Making Sense Of It All***, scheduled for October 6-8, 2002, in Vancouver, British Columbia at the Sheraton Wall Centre Hotel.

Please mark your calendar for this crucial conference. Some of the key selected themes and sessions for the conference are listed below. The plenary sessions will be interspersed with concurrent sessions designed to focus attention on major sub-themes. Ample time has been reserved for more in-depth discussion of the papers and their implications.

### **Energy Security in the 21<sup>st</sup> Century**

*Session Chair: Robert Ebel*

- Geopolitical Risks
- Growing Asian Import Dependence
- Reliable Suppliers – Russia, Central Asia, the Caspian

### **Continental Energy Markets Prospects**

*Session Chair: Leonard Coburn, U.S. Department of Energy*

- Enhanced Regional Integration
- Common Energy Picture
- Harmonization on Standards

### **California Fallout: What Useful Lessons Can Be Learned?**

*Session Chair: Perry Sioshansi, Menlo Energy Economics*

- What Went Wrong?
- Resolving the Situation
- Lessons for Other Jurisdictions

### **Offshore Petroleum Industry: Reflections on Moving Forward**

*Session Chair: Merete Heggelund, Norsk Hydro*

- Economics of Offshore Projects
- Local Procurement for a Global Industry
- Environmental Issues

### **Canada – U.S. Natural Gas Trade Prospects**

*Session Chair: Campbell Watkins*

- Resource prospects
- Market considerations
- Transmission expansion

### **Fossil Fuels and Sustainability: Like Oil and Water?**

*Session Chair: Mark Jaccard, Simon Fraser University*

- Decarbonating Fossil Fuels
- Sequestering Carbon
- Technology Synergies

### **Energy Regulation Trends and Prospects in North America**

*Session Chair: Michelle Foss, University of Houston*

- What Kind of Markets are Being Built?
- How is Success Measured? By Price?
- How Much Restructuring is Needed for Electricity?

There are 24 planned concurrent sessions (note the enclosed information on Call for Papers for this meeting – the abstract cut-off date is May 1, 2002. Conference organizers are open to setting aside some concurrent sessions to cover joint submissions by a group of authors (maximum 4 per concurrent session). Given the location of the meeting in Vancouver, we anticipate an even larger draw to our concurrent sessions. The conference organizers STRONGLY SUGGEST that you get your abstract in extra early so that prompt follow-up can be given.

Vancouver, British Columbia is a wonderful and scenic/tourist place to meet. Single nights at the Sheraton Wall Centre Hotel are \$224.00 Cdn. (approximately \$150.00 U.S. dollars – a phenomenal rate) per night. Contact the Sheraton Wall Centre Hotel at 604-893-7120, to make your reservations). Conference registration fees are \$500.00 for USAEE/IAEE members and \$600.00 for non-members. Your registration fee includes two lunches, a dinner, three receptions and numerous coffee breaks, all designed to increase your opportunity for networking. Special airfares have been arranged through Air Canada. Please contact Air Canada by calling 800-361-7585 (or 514-393-9494) and reference our group #CV625181. These prices make it affordable for you to attend a 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 may become involved with this important 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.

## ***Energy Markets in Turmoil: Making Sense Of It All***

22<sup>nd</sup> Annual North American Conference of the USAEE/IAEE

Please send me further information on the subject checked below regarding the October 6-8, 2002 USAEE/IAEE Conference.

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# Australian Electricity Reform: A Regulatory Quagmire

By Deepak Sharma\*

## Abstract

The electricity industry in Australia is in the throes of significant and fundamental change in its structure, ownership and mindset. Much of the industry has been functionally unbundled and placed under public-corporate or private ownership. The competitive segments of the industry have progressively been exposed to competition and the choice has gradually moved towards the consumer. The rationale behind this change is essentially economic. The competition and choice offered by the new order, it is argued, will result in higher economic productivity, lower electricity prices, and increased domestic and international competitiveness. A sound regulatory framework is, however, a prerequisite for the realization of such economic benefits, as the link between reform policy and its expected benefits is not a direct one. It is the regulatory framework which will determine actual benefits, not just the broad policies on reform. The design of such framework will depend on the country's history, politics, institutional structures, decision process mechanisms, policy dogmas and planning philosophies. This paper investigates the evolving nature of regulatory processes in the context of the Australian electricity industry. The investigation reveals that the Australian federal system; the state stewardship of the electricity industry; the legal arrangements; the apparent preoccupation - by the architects of the market - with the design of the wholesale market and a neglect of the (politically difficult) retail market; the general lag between the designs of market and regulatory structures; and a lack of clear focus has resulted in a regulatory framework which is typified by a high degree of jurisdictional overlap, ambiguity, confusion, inconsistency and unaccountability. Further, it seems to be following rather than guiding the evolution of the electricity industry. This, clearly, has the potential to seriously jeopardize the expected gains from electricity industry reform.

## Introduction

The electricity industry in Australia has been in the throes of reform for a considerable time now. The motivation behind this reform is quintessentially economic – the reform will improve the domestic and global competitiveness of the Australian economy. The public approval for this reform has generally been sought through a mix of simplified arguments – lower electricity bills and significant savings for residential consumers; empowering the people; improved profitability for businesses which will create more jobs; private ownership of industry will free government money which will then be spent on schools, hospitals and roads; moreover, reform is

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good for the environment.

'Competition' and 'choice', preferably under private ownership, are considered to be the essential prerequisites for achieving the objectives of reform. Accordingly, much of the Australian electricity industry has been functionally unbundled, competition has been introduced in the competitive segments of the industry, the monopoly segments of the industry have been restructured as regulated corporate entities, and the 'choice' has gradually moved towards the consumer. Substantial segments of the industry have been privatized, and the pressure for privatization weighs heavily on the rest.

The rules for the governance of the electricity industry have been developed in the form of a National Electricity Code (simply called - the Code). The Code – rules, institutions, decision mechanisms and other associated accouterments constitute, in the context of this paper – the regulatory framework for the electricity industry. This regulatory framework – in consonance with the ever changing dynamics of the reform process and the body politic – is an evolving entity.

In recent times, concerns have emerged among the electricity industry participants and the community at large about the inherent complexity of the regulatory framework. While the concerns of the industry generally relate to the excessive economic burden imposed by such complexity, the community disquiet is due to the apparent subjugation of their interests and rights to an economic agenda. It is therefore argued that the present framework is unlikely to be able to satisfactorily guide the evolution of the electricity industry in a balanced and socially desirable manner.

There is, clearly, a need for a reassessment of the suitability of the existing regulatory framework in Australia. This paper is an attempt in that direction. The following sections contain: a) a brief overview of evolution of the electricity industry in Australia, b) a description of the existing regulatory framework, and c) an examination of the main regulatory issues. This paper does not debate the merits of individual regulation. Instead, it draws together the various strands of the regulatory framework in Australia with a view to identifying the sources and causes of its complexity and associated regulatory issues.

## Electricity Industry in Australia

This section provides a brief overview of the evolution of the Australian electricity industry. This will enable a better appreciation of the subtleties of the regulatory issues.

Australia is a confederation of six states and two federal territories (for simplicity of exposition, the territories are referred to as states in this paper). The electricity industry in each state developed around the state capitals and rural activity centers in the late 19<sup>th</sup> century. The electricity generation was typically distributed, and the industry ownership consisted of a mix of private and public enterprises (Sharma and Bartels, 1997). The earlier decades of the 20<sup>th</sup> century witnessed a rapid expansion of the electricity industry, and a move towards vertical integration, centralized planning and operation, public ownership, and command-and-control type of governance.

In the post-war years, there was a further consolidation and indeed an entrenchment of this model of industry structure, ownership and governance. An interesting feature of electricity development in Australia is that each state developed its electricity industry in complete isolation from another. Reasons include: electricity is constitutionally a

state matter; fierce interstate rivalries have traditionally existed between Australian states; Australian states have a penchant for state sovereignty.

Consequently, the Australian electricity industry comprised distinct state-based electricity systems with contrasting technical standards and benchmarks, voltage systems, structures, and governance philosophies, and virtually no interconnection between them. Each state planned, established, operated and governed its industry exclusively according to its priorities and interests, e.g., promoting the use of state resources, creating employment within the state, ensuring complete independence from other states for meeting electricity needs of the state.

In the early 1980s, concerns began to be expressed about the inefficiencies of the electricity industry in Australia. A number of reform initiatives – focusing mainly on better management and control of the industry – were undertaken by the state governments and the state electricity utilities. These initiatives resulted in appreciable efficiency gains (Sharma, 2000).

A further impetus, and a different character, to the reform process was provided in the late 1980s by the interplay of forces unleashed by the globalization of the world economy and the ascendancy of the faith in free market principles. The Australian response to these pressures included the introduction of a series of reforms under the broad banner of ‘microeconomic reform’. The reform of the electricity sector was an integral aspect of this reform program (Sharma and Beardow, 1999).

In the early to mid 1990s, several agreements were reached between various governments in Australia to reform the electricity industry. A central element of this reform was the creation of a National Electricity Market (NEM) in accordance with the precepts of the National Competition Policy (NCP). The NCP emphasized efficiency gains through the creation of competitive markets.

In order to comply with the requirements of the NEM, the Australian states which were party to the NEM, restructured their electricity industries. As electricity is constitutionally a state matter in Australia, each state followed a different approach to restructuring with regards to the shape and size of its restructured industry and the speed of restructuring. Notwithstanding these differences, the general nature of structural change in each state included the separation of generation, transmission, distribution and retail segments of the industry; introduction of competition in generation and retail, re-orientation of transmission and distribution to support and encourage competition. Additionally, each state has adopted a different model of industry ownership – private, de-facto private, private/public, tenuously public, and public.

The NEM encompasses a competitive wholesale market for generation, regulated transmission systems with legislated access rights and a system controller. The regulated distribution networks and the retail supply market remains within the jurisdiction of the state governments.

In the NEM, all generators greater than 30MW compete by lodging bids to supply electricity to a common pool on a half-hourly basis. Bids are ranked by a central grid operator and dispatched by regional centers based on economic criteria. The pool price for any half hour is the price of the marginal generator that is scheduled, i.e., its short-run marginal cost. All generators that run during a particular half hour receive remuneration at the pool price for that half hour (Sharma and Sproule, 1998).

In the fully operational version of the NEM, wholesale traders (licensed retailers, wholesale electricity customers and independent traders) will be able to purchase electricity directly from the pool and manage price volatility with bilateral hedging (Sharma and Sproule, 1998). Licensed retailers have access to transmission and distribution networks on equal terms, and compete for the non-franchise market. It is planned that the regional retail franchises will progressively be abolished in all states, and by the end of 2002, all customers will be able to choose their own retail suppliers.

### **Regulatory Framework**

The electricity industry in each state has traditionally been regulated through state regulation with no federal interference. The general character of this regulation was prescriptive, and its implementation was of the command-and-control type. However, the adoption by the states of the NCP, and the creation of the NEM has resulted in the emergence of a new regulatory framework. The principle elements of this framework include:

**General Market Regulation:** This regulation aims to ensure that electricity as a market commodity, and electricity networks as monopoly assets, comply with the provisions of the federal Trade Practices Act (TPA). The TPA is a Commonwealth law meant to enforce the NCP. The TPA achieves this through a system of ‘authorizations’ of structure and trade related issues and ‘acceptances’ for network pricing and network access arrangements. The TPA is administered by the Australian Competition and Consumer Commission (ACCC) – a federal regulator. The specific responsibilities of ACCC include: the authorization of the Code and any changes to it, and acceptance of the access undertakings under the TPA; regulation of network access and network pricing; supervision of market conduct behaviour, especially the prevention of the abuse of market power; and arbitration of disputes arising from access declaration (PC, 1996; Trimmer, 2000).

**National Electricity Market (NEM) Regulation:** The regulatory provisions for the NEM are set out in the Code. The Code was developed by the National Grid Management Council (NGMC), in consultation with a cross section of industry and community interest groups. The membership of the NGMC was, however, drawn exclusively from the participating states. The Code was approved by the Ministers in all participating states and authorized by the ACCC. The Code is an all encompassing document containing the rules for participation in the wholesale market, market operations, system security arrangements, network connection and access arrangements, network pricing, metering, market administration, and transitional arrangements (NEMMCO, 1997).

The Code is administered by the National Electricity Code Administrator (NECA). The NECA is a ‘limited company’, funded by participant fees. Its membership comprises energy ministers of the participating states, and its board is made of ministers’ nominees. The NECA is expected to lead the existing market towards a competitive market in an efficacious manner. Its roles include: maintaining and reporting on Code compliance; enforcing the Code and civil penalties for minor Code breaches; facilitating changes to the Code; granting derogations from the Code; registering metering providers; and providing means of effective dispute resolution (Trimmer, 2000).

*(continued on page 24)*

## **Australian Electricity Reform** *(continued from page 23)*

The conduct of the wholesale power pool and system operation are administered by the National Electricity Market Management Company (NEMMCO). The NEMMCO is also a 'limited company', funded by participant fees, with membership comprising of the energy ministers of participating states working through a nominated board.

The legal force to the Code is provided by the National Electricity Law which has been enacted at the state level in all participating states to ensure regulatory consistency across the NEM (Roarty, 1998). Changes to the National Electricity Law can only be achieved through the unanimous support of the participating states. The National Electricity Law also gives legal imprimatur to the National Electricity Tribunal, defines funds for NECA and NEMMCO, establishes certain requirements for registration with NEMMCO, and defines civil penalties (Trimmer, 2000).

The National Electricity Tribunal is a judicial body of part time members with skills relevant to the electricity industry. It reviews decisions of NECA and NEMMCO identified within the Code as reviewable decisions and determines applications by NECA alleging breaches of the Code. The Australian Securities and Investment Commission (ASIC) determines whether an exempt futures market declaration should be granted to market participants under the Commonwealth law. This declaration will affect the ability of the market participants to trade in hedge contracts (NEMMCO, 1997).

**Monopoly Network Regulation:** The economic regulation of monopoly networks for aspects relating to pricing, access, security, and performance is presently within the jurisdiction of the state regulators, except for the NSW transmission network which is regulated by the ACCC. And there are significant regulatory contrasts across the state jurisdictions. The regulation of transmission networks in all states will progressively transfer to the ACCC.

**Retail Market Regulation:** The retail market in each state is regulated by the state regulators through a variety of licensing and approval arrangements. Considerable contrasts exist between the states.

**Other Regulation:** The Commonwealth Office of Regulation Review (ORR) vets and reviews regulations to ensure that they are properly formulated and do not impose undue costs on business and the community. The National Competition Council (NCC) monitors compliance in all jurisdictions including the Commonwealth in accordance with the Competition Principles Agreement. The ACCC sponsors a Public Utility Regulators Forum which acts as a focal point for regulators in various jurisdictions. The NEM entities are also regulated by the Corporations Law for aspects relating to tax, accounting standards, and management behaviour. A variety of federal and state environmental regulation also applies to market operations.

Figure 1 provides a snapshot of the current regulatory framework in Australia. It is evident that the regulatory framework in Australia is indeed complex. It is typified by a multiplicity of institutional involvement, jurisdictional contrasts and overlaps. This complexity is primarily due to the legacy of the Australian constitution that assigns the responsibility – to the state – for the supply of electricity to the end consumer. Electricity has a deep-rooted societal connection and – in a parliamentary democracy like Australia – a political

connection. Moreover, electricity is big business. Any major reform of the electricity industry will, therefore, invariably create economic, social and political tensions. A good regulation should be able to manage these tensions in a professionally responsible, socially desirable and politically acceptable manner.

A review of the Australian experience suggests that the focus of federally-driven industry reform has been preponderantly global and economic. The ramifications of industry reform are however largely state specific and political. There is, therefore, a natural conflict between these two. The states have attempted to manage this conflict by orchestrating a state capture of the regulatory process. For example, the 'state only' membership of NGMC (market designer), NECA (market administrator), and NEMMCO (market operator) has ensured the continuation of state stranglehold of their electricity industries (also see Booth, 2000). The preoccupation, by the architects of the market with the design of the wholesale segment and the deferment of the design of the politically sensitive retail segment with the reasoning that retail issues fell within state jurisdictions; the nature and volume of Code derogations; and the ever sliding time schedules for market implementation – are testimony to the state influence on industry regulation.

A direct consequence of this conflict is that the Australian NEM comprises one wholesale market and five distinct and contrasting retail markets. These contrasts relate to market structures, the nature and intensity of institutional involvement, customer contestability schedules, metering provisions, environmental protection measures, contractual arrangements, health and safety aspects, and quality of supply. The regulatory scene has been further complicated by the interplay of forces arising from the superimposition – on the state regulation – of the federal regulation meant to further federal interests at the state, national and international levels.

### **Regulatory Issues**

This complexity of the regulatory framework has given rise to a myriad of regulatory issues. A selective list of such issues include:

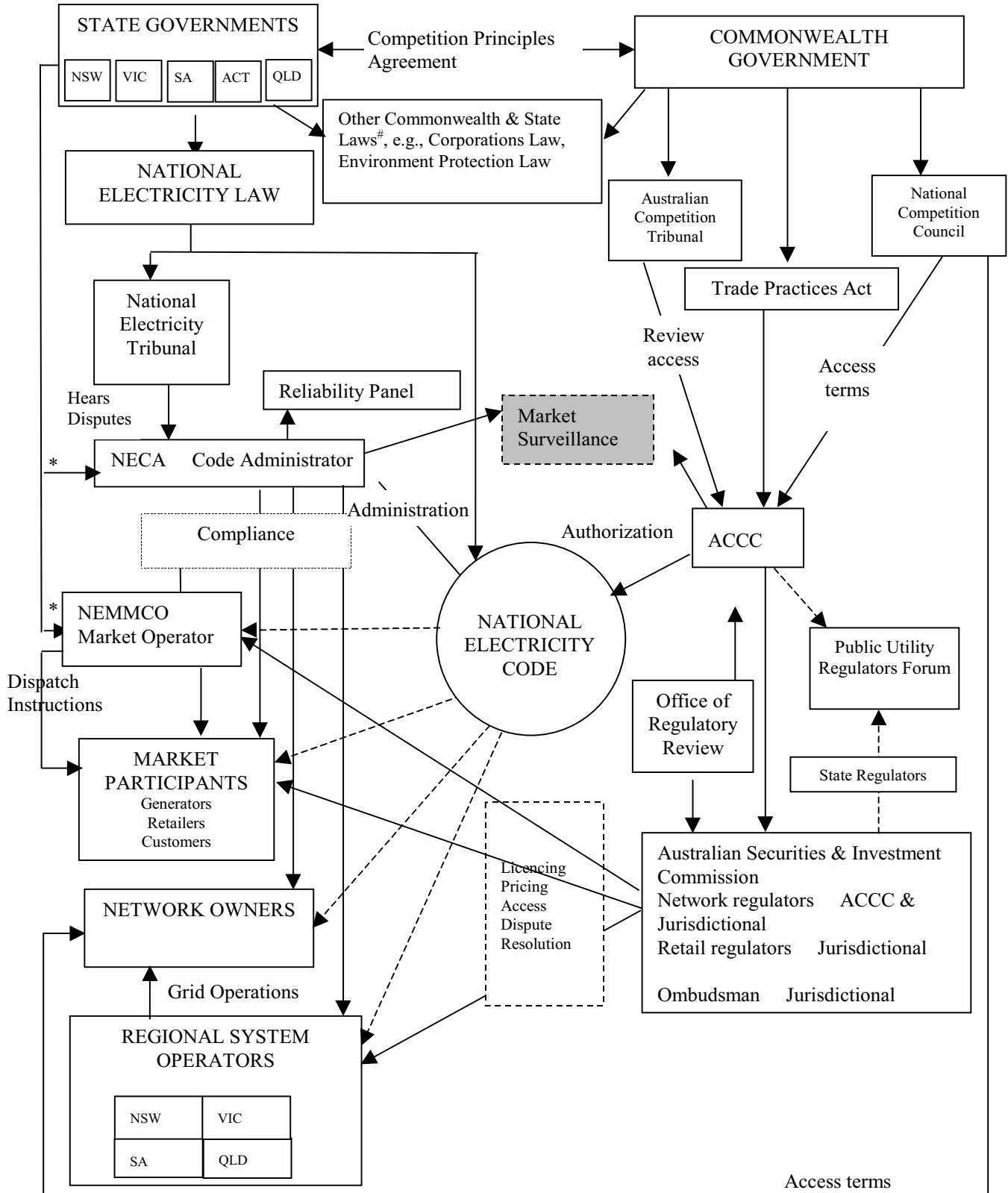
**Regulatory risk** – Regulation incurs costs either directly as in compliance costs, or indirectly, through the risks attached to the administration of regulation. There is concern that principles established in one regulatory period, and upon which business bases its long-term investment decisions, are not consistent over time. Regulations are being re-interpreted in the subsequent period or by subsequent regulators. This uncertainty raises the risk level for NEM participants and lifts borrowing costs (Sharma and Beardow, 1999). According to ESAA (1998) '... regulatory risk has become a major commercial concern for the businesses, impacting on profit, shareholder value, and sale price ...'.

**Compliance costs** – Compliance costs are now emerging as a major barrier to entry. For example, retailers operating in more than one market require a separate license from each jurisdiction. This clearly raises the cost of retailing. In addition, there are several other regulatory costs that could arise from the inherent complexity of the regulatory framework. The ESAA argues that '... the overall cost to electricity supply business and governments across Australia of regulation was of the order of \$100 million per annum, with costs

*(continued on page 26)*



**Figure 1 Australian Regulatory Framework**



Main sources: ESAA (1996), Trimmer (2000)

Notes: # Applicable to all market participants

\* States appoint board members

The figure is indicative - it shows major links only.

### **Australian Electricity Reform** (continued from page 24)

to the business being in excess of \$50 million ... actual costs may in fact be higher ... ongoing costs are eroding the benefits of competition to a significant extent ... there are a number of burdens imposed by current regulatory frameworks and approach that are adding to the costs ... they are due to numerous Acts, plethora of orders, regulations, guidelines and codes pursuant to each Act ... more onerous due to inconsistencies, complexity, ambiguity and overlap or duplications across the jurisdictions ...' (ESAA, 1998).

**Lack of incentives for dynamic investment** – Proposed pricing mechanisms for economic regulation of monopoly networks fail to provide adequate incentives to justify dynamic investment. Without investment to lift efficiency above existing levels, the reforms will not achieve the objective of increasing productivity and providing increased customer service.

**Inconsistent approaches to full contestability** – The agreement by different states relating to the move towards full customer contestability is not accompanied by an corresponding agreement on the mechanism for its implementation. A discussion with electricity industry professionals suggests that there are serious and growing concerns about this issue which could, in the longer term, militate against efficient pricing (Sharma and Beardow, 1999).

**Neglect of social/environmental issues** – The principles for the operation of the pool (as discussed earlier) do not clearly encourage any consideration of technical (other than in an immediate sense), social (employment, equity, justice) or environmental (emissions reduction, renewables) factors which will invariably result in higher costs (also see Sharma, 2000).

**Inadequate protection of consumer interests** - Concerns have emerged that the current regulatory framework does not satisfactorily look after the interests of small consumers. For example, in the context of Victoria, Coyle et al. (2000) have the following to say: '... the transition ... has created enormous complexity in protecting consumer interests ... the existing regulatory regime has no mechanism for allowing consumer interests to be protected from exploitation through unfair discriminatory tariffs ... residential customers are vulnerable to unfair discriminatory pricing ... full retails competition introduces new risks for individual consumers including the loss of privacy and the possibility of being discriminated against in marketing by retailers'. These sentiments are also echoed by Paddon and Small (1999): '... structural changes ... against a backdrop of jurisdictional differences and territoriality ... provide no longer-term basis for consumers to believe that their interests will be protected'. Also, according to ESAA (1998): '... regulations at national levels ... at state levels ... multiplicity of interfaces issues of fairness and equity also arises ... regulators are not sufficiently accountable for their decisions ...'.

#### **Summary**

The regulatory framework for the Australian electricity industry is complex. Reasons include: the federal nature of the Australian political system, the historic ownership patterns, state predilection for sovereignty, and the state capture of the regulatory process. This complexity has given rise to a myriad of issues which have the potential to negate the gains expected from electricity deregulation. There is, therefore, a need to acknowledge the criticality of the link between the

deregulation policy and the benefits of deregulation. It is the regulatory reform that bears directly upon economic efficiency (the *raison d'être* of deregulation), not just broad deregulation policies. It is the regulatory framework embodied in the institutional structures, market codes and access and pricing methodologies, which determines to what extent a particular market would achieve responsible, desirable and acceptable outcomes.

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• **Professional Journal:** The Energy Journal is the Association's distinguished quarterly publication published by the Energy Economics Education Foundation, the IAEE's educational affiliate. The journal contains articles on a wide range of energy economic issues, as well as book reviews, notes and special notices to members. Topics regularly addressed include the following:

- |                                  |                             |
|----------------------------------|-----------------------------|
| Alternative Transportation Fuels | Hydrocarbons Issues         |
| Conservation of Energy           | International Energy Issues |
| Electricity and Coal             | Markets for Crude Oil       |
| Energy & Economic Development    | Natural Gas Topics          |
| Energy Management                | Nuclear Power Issues        |
| Energy Policy Issues             | Renewable Energy Issues     |
| Environmental Issues & Concerns  | Forecasting Techniques      |

• **Newsletter:** The IAEE Newsletter, published four times a year, contains articles dealing with applied energy economics throughout the world. The Newsletter also contains announcements of coming events, such as conferences and workshops; gives detail of IAEE international affiliate activities; and provides special reports and information of international interest.

• **Directory:** The Annual Membership Directory lists members around the world, their affiliation, areas of specialization, address and telephone/fax numbers. A most valuable networking resource.

• **Conferences:** IAEE Conferences attract delegates who represent some of the most influential government, corporate and academic energy decision-making institutions. Conference programs address critical issues of vital concern and importance to governments and industry and provide a forum where policy issues can be presented, considered and discussed at both formal sessions and informal social functions. Major conferences held each year include the North American Conference and the International Conference. IAEE members attend a reduced rates.

• **Proceedings:** IAEE Conferences generate valuable proceedings which are available to members at reduced rates.

To join the IAEE and avail yourself of our outstanding publications and services please clip and complete the application below and send it with your check, payable to the IAEE, in U.S. dollars, drawn on a U.S. bank to: International Association for Energy Economics, 28790 Chagrin Blvd., Suite 350, Cleveland, OH 44122. Phone: 216-464-5365.

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\_\_\_\_ Yes, I wish to become a member of the International Association for Energy Economics. My check for \$60.00 is enclosed to cover regular individual membership for twelve months from the end of the month in which my payment is received. I understand that I will receive all of the above publications and announcements to all IAEE sponsored meetings.

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## Future IAEE Events

June 26-29, 2002	25th IAEE International Conference Aberdeen, Scotland <i>Aberdeen Exhibition and Conference Centre</i>
October 6-8, 2002	22nd USAEE/IAEE North American Conference Vancouver, BC, Canada <i>Sheraton Wall Centre Hotel</i>
June 5-7, 2003	26th IAEE International Conference Prague, Czech Republic <i>Dorint Prague Hotel</i>

## Publications

**World Petroleum Industry Outlook, 18<sup>th</sup> Edition.** Robert J. Beck (2002). Price: \$195. Contact: PennWell. Phone: 800-752-9764/918-831-9421. Fax: 877-218-1348/918-831-9555. Email: orders@pennwell.com URL: www.pennwell-store.com

**The Outlook For Gas in Europe: The Markets Start to Open.** (December 2001). 146 pages. Price: \$895. Contact: Emerging Markets Online, 7171 Buffalo Speedway #632, Houston, TX 77025. Phone: 713-349-8281. Fax: 713-348-8380. Email: service@emerging-markets.com URL: www.emerging-markets.com

**Texas Power Markets: Restructuring/Competition Report.** (2002). 130 pages. Price: \$995. Contact: PMA, 3304 Dye Dr., Falls Church, VA 22042. Phone: 703-641-0613. Fax: 703-641-9265.

**Prospects for Caspian Gas.** (September 2001). Price: #1250. Contact: Centre for Global Energy Studies, 17 Knightsbridge, London SW1X 7LY, UK. Phone: 44-20-7235-4334. Fax: 44-20-7235-4338. URL: www.cges.co.uk/caspiangas.htm

**The Role of the Federal Government in Distributed Energy.** (2002). 70 pages. Price: FREE. Contact: The Center for the Advancement of Energy Markets (CAEM), PO Box 66374, Washington, DC 20005. Phone: 202-496-4972. URL: www.caem.org

**The Role of the Default Provider in Restructured Energy Markets.** (2002). Price: FREE. Contact: The Center for the Advancement of Energy Markets (CAEM), PO Box 66374, Washington, DC 20005. Phone: 202-496-4972. URL: www.caem.org

**Annual Oil Market Forecast and Review 2002,** (2002). Price: #650. Contact: Centre for Global Energy Studies, 17 Knightsbridge, London SW1X 7LY, UK. Phone: 44-20-7235-4334. Fax: 44-20-7235-4338. URL: www.cges.co.uk/caspiangas.htm

**B2B Energy Trading: The Surge On-Line,** (2001). Price: \$1195. Contact: Emerging Markets Online (EMO). Phone: 713-349-8281. URL: www.emerging-markets.com

**Oil in Texas The Gusher Age, 1895-1945,** Diana Davids Olien and Roger M. Olien. (March 2002). 352 pages. Price: \$39.95. Contact: University of Texas Press, PO Box 7819, Austin, TX 78713. Phone: 800-252-3206. URL: www.utexas.edu/utpress/

**Petro-Dragon's Rise: What It Means for China and the World,** Xiaojie Xu. (September 2002). 200 pages. Price: not available. Contact: European Press Academic Publishing, Via Valle Bantini, 4-50050 Fucecchio (Florence), Italy. Fax: 39-0571-296335. Email: orders@e-p-a-p.com

**Understanding Iran's Economy And its Oil and Gas Industry,** Dr. Manouchehr Takin. Price: #2750. Contact: Marketing

Department, Centre for Global Energy Studies, 17 Knightsbridge, London, SW1X 7LY, United Kingdom. Phone: 44-20-7309-6310. Fax: 44-20-7235-4338. Email: marketing@cges.co.uk URL: www.cges.co.uk

**Bossley's Energy Conversions,** (March 2002). 96 pages. Price: \$110. URL: www.petroleum-economist.com/bossley/

## Calendar

**21-23 April 2002, 10th Annual Coal Properties & Investments Conference at Amelia Island Plantation.** Contact: Michelle Murray, Conferences, Platts, 13111 Northwest Fwy #520, Houston, TX, 77040, USA. Phone: 713-939-5803. Fax: 713-9390-5838 Email: michelle\_murray@platts.com URL: www.platts.com

**21-23 April 2002, ICEED's 29th International Energy Conference on "Risk and Uncertainty: Challenges and Opportunities for the Energy Sector"** at Boulder, Colorado. Contact: Dr. Dorothea H. El Mallakh, Director, ICEED, International Research Center for Energy and Economic Development (ICEED), 850 Willowbrook Road, Boulder, Colorado, 80302, USA. Phone: 303-442-4014. Fax: 303-442-5042 Email: iceed@stripe.colorado.edu URL: www.iceed.org

**22-23 April 2002, Restructuring Transmission Operations** at Alexandria, VA. Contact: CBI Registration, CBI, Registration Department, 500 W Cummings Park, Ste 5100, Woburn, MA, 01801, USA. Phone: 800-817-8601/781-939-2438. Fax: 781-939-2490 Email: kimh@cbinet.com URL: cbinet.com

**22-22 April 2002, EU Climate Change Policy: A Fresh Look at the Economic Effects on the UK and Alternative Approaches for Reducing Greenhouse Gas** at Westminster, London. Contact: Forum Director, EU Climate Change Policy, Priority Court, Pilgrim Street, London, EC4V 6DR, United Kingdom. Phone: 44-20-7618-9104. Fax: 44-20-7329-7301

**23-24 April 2002, Investment Opportunities in the Italian Gas and Power Industry** at Rome, Italy. Contact: The CWC Group, Conference Registration, The CWC (Europe) Limited, 3 Tyers Gate, London, SE1 3HX, United Kingdom. Phone: 39-06-47091. Fax: 39-06-4201-4201 Email: bookings@thecwcgroup.com URL: www.thecwcgroup.com

**23-24 April 2002, Renewable Energy Summit** at One Whitehall Place, London. Contact: Alex Gerber, Conference Organizer, Global Business Network Ltd, 9 Wimpole Street, London, W1M 8LB, United Kingdom. Phone: 44-20-7291-1030. Fax: 44-1553-770441 Email: info@gbnuk.com URL: www.gbnuk

**23-24 April 2002, ICEED's 23rd Annual International Area Conference,** "Domestic and Global Dimensions of US Energy Policy" at Boulder, CO. Contact: Dorothea El Mallakh, International Research Center for Energy & Economic Development, 850 Willowbrook Road, Boulder, CO, 80302, USA. Phone: 303-442-4014. Fax: 303-442-5042 Email: iceed@stripe.colorado.edu URL: www.iceed.org

**24-25 April 2002, Risk Assessment and Portfolio Management** at Houston, Texas. Contact: Katrina Gregory, Senior Marketing Manager, IQPC, Anchor House, 15-19 Britten Street, London, N/A, SW3 3QL, United Kingdom. Phone: +44 (0) 20 7368 9406. Fax: +44 (0) 20 7368 9303 Email: katrina.gregory@iqpc.co.uk URL: www.iqpc.com/NA-1772/eduary

**24-25 April 2002, Latin American Regional Farmout & Exploration Promotion Forum 2002** at Sheraton Suites, near the Galleria, Houston, USA. Contact: Babette van Gessel, Group Managing Director, Global Pacific & Partners, 2nd Floor, Regent Place, Cradock Avenue, Rosebank, Johannesburg, 2196, South Africa. Phone: 27 11 778 4360. Fax: 27 11 880 3391 Email: info@glopac.com URL: www.petro21.com

**27-28 April 2002, Strategies for Regulating Privatised Utilities** in Saudi Arabia at Riyadh, Saudi Arabia. Contact: Ms

(continued on page 32)

**Calendar** (continued from page 31)

Naheed Sharmin Islam, Marketing Manager, CWC Associates, 3 Tyers Gate, London, SE1 3HX, UK. Phone: +44 (0) 20 7089 4188. Fax: +44 (0) 20 7089 4201 Email: nislam@thecwcgroup.com URL: <http://www.thecwcgroup.com>

**29-30 April 2002, IBC's Inaugural Australian Wind Energy Conference** at Melbourne, VIC, Australia. Contact: Cathy Lloyd, IBC Conferences Australia, Level 2, 120 Sussex St, Sydney, NSW, 2000, Australia. Phone: +61 (0)2 9080 4300. Fax: +61 (0)2 9290 3844 Email: enquiries@informa.com.au URL: <http://www.ibcoz.com.au/windenergy2002>

**30-30 April 2002, Renewable Energy UK Government Policy and Industry Opportunities** at Edinburgh. Contact: Tracey Egerton, DLA Advance, 101 Barbirolli Square, Manchester, M2 3DL, United Kingdom. Phone: 0131-556-2414. Fax: 0131-557-3747 Email: [dla-advance@dla.com](mailto:dla-advance@dla.com) URL: [www.dla-advance.com](http://www.dla-advance.com)

**2-3 May 2002, 3rd Annual Nigeria Oil & Gas Conference** at London, UK. Contact: Ms Naheed Sharmin Islam, Marketing Manager, CWC Associates, 3 Tyers Gate, London, UK. Phone: +44 (0) 20 7089 4188. Fax: +44 (0) 20 7089 4201 Email: nislam@thecwcgroup.com

**2-3 May 2002, Gas Processing Contracts & Negotiations** at Houston, Texas. Contact: Registrar, Energy Seminars Inc., PO Box 7979, The Woodlands, TX, 77387, USA. Phone: 281-362-7979. Fax: 281-296-9922 Email: registrar@energyseminars.com URL: [www.energyseminars.com](http://www.energyseminars.com)

**7-8 May 2002, Power & Gas Asia 2002** at Singapore. Contact: Ms. Geraldine Wong, IBC Asia (S) Pte Ltd, No. 1 Grange Road, #08-02 Orchard Bldg, Singapore, 239693, Singapore. Phone: 65-6732-1970. Fax: 65-6733-5087 Email: [audrey.chen@ibcasia.com.sg](mailto:audrey.chen@ibcasia.com.sg)

URL: [www.ibc-asia.com/rgyform.htm](http://www.ibc-asia.com/rgyform.htm)

**7-8 May 2002, 2nd Annual Conference GTL Commercialization** at Singapore. Contact: Ms. Cynthia Yeo, Event Manager, Centre for Management Technology, 80 Marine Parade Road, #13-02 Parkway Parade, Singapore, 449269, Singapore. Phone: 65-6346-9132. Fax: 65-6345-5928 Email: [cynthia@cmtsp.com.sg](mailto:cynthia@cmtsp.com.sg) URL: [www.cmtevents.com](http://www.cmtevents.com)

**8-9 May 2002, Commercializing Clean Coal 2002 Conference** at Pittsburgh, Pennsylvania. Contact: Charles Spear Jr, Conference Director, Intertech, 19 Northbrook Dr, Portland, ME, 04105, USA. Phone: 207-781-9612. Fax: 207-781-2150 Email: [chuck@intertechusa.com](mailto:chuck@intertechusa.com) URL: [www.intertechusa.com](http://www.intertechusa.com)

**13-15 May 2002, Asia's Energy Future: Economic Growth and Security** at Shangri-La Hotel, Singapore. Contact: Robert W. Radtke, VP, Policy and Business Programs, Asia Society, 725 Park Avenue, New York, NY, 10021-5088, USA. Phone: 212-288-6400. Fax: 212-517-8315 URL: [www.asiasociety.org](http://www.asiasociety.org)

**14-15 May 2002, Green Trading Summit: Emissions, Renewables & Negawatts** at McGraw-Hill Conference Center, New York City. Contact: Marion Yuen, USA. Phone: 718-230-5402 URL: [www.global-change.com/conferences.html](http://www.global-change.com/conferences.html)

**14-15 May 2002, Lusophone Oil & Gas 2002** at Sheraton Lisboa Hotel & Towers, Lisboa, Portugal. Contact: Babette van Gessel, Group Managing Director, Global Pacific & Partners, Private Bag X61, Saxonwold, Gauteng, 2132, South Africa. Phone: 27 11 7784360. Fax: 27 11 8803391 Email: [info@glopac.com](mailto:info@glopac.com) URL: [www.petro21.com](http://www.petro21.com)

**14-15 May 2002, Energy and Power Risk Management 2002 USA** at Houston, TX. Contact: Adam Jordan, Risk Waters. Phone: 44-0-20-7484-9908 Email: [ajordan@riskwaters.com](mailto:ajordan@riskwaters.com)

**IAEE Newsletter**

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