IA INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS
EE

Newsletter

Published by the Energy Economics Education Foundation, Inc.

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

Third Quarter 2001

President's Message

I would like to take this opportunity to address some aspects of international gas trade and global gas resources. I believe that gas as an energy source will play an even more important role in the future. Different long term planning scenarios suggest that global gas demand could more than double by 2020. The resource is abundant. Gas is the most attractive fuel for generating electricity – the fastest growing form of energy. Gas makes an interesting bridge between the oil and gas industry and the electricity industry. Additionally gas has great environmental advantages relative to other fossil fuels. Efforts to reduce atmospheric carbon dioxide emissions will profoundly affect energy markets. They will impose a cost on carbon emissions whether by taxation or trading.

Natural gas markets have been liberalised in the United States and are about to be liberalised in the European market - along with free access principles in transportation systems. We will see a more competitive market place and lower energy prices to the end consumer. Gas will, therefore, become relatively more attractive and we will see an increase in the gas consumption in these markets.

Europe, as an example, is surrounded by vast amounts of gas. First of all indigenous gas from the North Sea area in the Netherlands, UK and Norway - then from Russia, North Africa and in the long run the possibility for supply from the Middle East. The United States and Europe already have a well developed pipeline system in place. I assume that in the future we will see larger trunk pipeline projects coming forward in different parts of the world. Additionally, we will see an expansion of LNG projects linking even more remote resource bases and consumer markets together. Different studies suggest an annual 8% global growth rate in future LNG business. Additionally we have recently seen interesting commercial attention to the development of GTL (Gas to Liquids) technology. GTL is currently a "flavour of the month" topic and nearly all the major companies have announced significant interest. The potential for gas to liquids technology to play a significant role in fully developing hydrocarbon resources has been widely publicised over recent months. There are vast amounts of gas resources in Southeast Asia that might fuel the revitalization of the Asian economies in the coming decades either through new pipeline systems or by LNG or GTL transportation.

Natural gas is an efficient feedstock to electrical power plants. The thermal efficiency of gas combined cycle power plants is considerably higher than other forms of generation, and is still improving and making these plants more competitive. There is also a lot of research and pilot projects to produce CO_2 emission free natural gas fueled power plants.

Another aspect of importance is the vast amount of associated gas that is flared around in the world. This is a waste of valuable economic resources and is not environmental friendly. In the future we will see many more projects developing around the commercial utilization of associated gas that is flared today.

The next Council meeting will be in London 8 September with BP as host. One of the agenda points is the continued discussion about how to further develop our organization world-wide. We have had a dialogue on the issue that in order to expand and broaden the membership, we need a much more focused and targeted marketing of IAEE internationally backed by budgetary funds. During the London meeting we

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Editor's Notes

Carol Dahl and Zauresh Atakhanova note that managing in global industries, such as oil and gas, requires an understanding of the human dimension including employees and customers. This, in turn, requires cultural and social skills. They go on to discuss various aspects of cultural/social differences that need to be understood in order to successfully manage.

Paul Stevens examines some of the restructuring in the upstream oil sector of Saudi Arabia, Kuwait and Iran and

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

will discuss a marketing plan put in place by Peter Fusaro. The objective is to make our organization much more visible in the future and to broaden our membership base and to foster increased growth. We will welcome any suggestions and initiatives from our members on the challenging issue how to better market our organization and the services that IAEE provides in the future.

On the international conference scene we had a very successful International Conference in Houston 25-27 April chaired and run by Michelle Foss. It is most satisfactory to note that IAEE now have a structured long term plan for future international conferences in: Aberdeen (2002), Prague (2003), Teheran (2004) and Taipei (2005). The future conference scene shows that IAEE has developed into a truly international organization.

Arild N. Nystad

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

notes the difficulties faced in each of the countries. He focuses on possible opening to the international oil companies, the reform and reorganization of the national oil companies and on privatization of the oil sector in each of the three countries.

William Edwards asks the question, what is the reason for OPEC's inability to achieve price stability, given member countries ability to control production? The answer, he says, is that while it is important to control production, inventories are the key to price volatility. The challenge to OPEC is one of supply management.

Reinhard Haas and Hans Auer write on competition in Western European electricity markets, noting that inexpensive electricity prices can only be sustained by excess capacities. Western European electricity capacities are declining, however, and in their judgment this does not bode well for the prices electricity consumers will pay in the future.

Perry Sioshansi brings us up-to-date on the California electricity situation and in the process traces just how the situation went so wrong. He notes that while a temporary fix may have been accomplished, the only real solution is to create a healthy excess generation reserve and demand elasticity. Until that time FERC must engage in a largely futile game of cops and robbers with the generators.

Paul Tempest asks the question: *Has Energy Economics a Viable Future?* In the process of answering it he reviews the 24th International Conference held in Houston this year, as reported by him to the meeting's concluding session. His conclusion: the profession will be providing challenging and satisfying employment to many for years to come.

Sebastien Barreau examines the wave of consolidations that has occurred in the oil and gas supply and services industry. He points out they have followed the theories propounded by Joseph Schumpter.

Finally, a note of clarification: The Policy Recommendations Summary on page 3 of the Second Quarter issue of the *Newsletter* are those of the United States Energy Association (USEA), not the United States Association for Energy Economics (USAEE). Though this is clearly stated in the article, apparently there was still some confusion.

DLW

Professor John Lohrenz

John Lohrenz died last April, two weeks after suffering a severe stroke. News of his untimely death has tended to be confined to the engineering fraternity. And indeed it is in the engineering field that John was most well known. But his abilities were broad ranging, and he was able to apply his quantitative skills, allied to his strong petroleum engineering background, to the economics of the upstream petroleum industry. And in this way he became known to the energy economics fraternity.

John's career spanned industry, government and academia. He started as a junior chemical engineer (in 1952) and progressed through service with Continental Oil (as Research Group Leader),with International Petrodata (as Executive Vice President), with the U.S. Geological Survey (Chief Applied Research and Analysis Section), with Gulf Exploration and Production Division, and with Chevron Oil Field Research Company. Given his focus on applied research, it was fitting that John's final position, commencing in 1989, should be academic, with his appointment as Professor of Chemical Engineering at Louisiana Technical University.

John had great expertise in reservoir modeling and simulation, which he taught at Louisiana Tech, but he also taught courses in oil and gas exploitation economics, offshore oil and gas development economics and applied statistics. His contributions to the engineering literature were many, but he also made his mark in petroleum economics, publishing in *The Energy Journal* most recently a paper on horizontal drilling, as well as participating in AIEE conferences. He was also a diligent referee for *The Energy Journal.* Here he brought a lot to the table since his skills in petroleum economic analysis were backed up his very extensive engineering knowledge - not many individuals were blessed with such a combination.

He was a lively reviewer of manuscripts, a vigorous disputant, and was willing to spend time as a peer reviewer, quite apart from more formal refereeing chores. His contributions were always valued by those fortunate enough to get his advice.

He is a great loss to the petroleum engineering and economics. We know of no one with his portfolio of skills.

Morry Adelman and
Campbell Watkins, March 13, 2001

IAEE Wants Your Feedback:

During the past year, IAEE has undertaken many new initiatives for its members. We have enhanced our website capabilities for search, links, and the Energy Journal, and have hired a webmaster. We intend to continue to innovate in this area. We have also brought student members to the Council as well as increased scholarship awards substantially as we reach out to the next generation. But we can bring more benefits to our members, therefore as Vice President for International Development, I am asking IAEE members to contact either myself or David Williams with your electronic suggestions that we can start assessing and implementing for Year 2002. I can be contacted at peterfusaro@global-change.com or contact Dave Williams at iaee@iaee.org.

We look forward to your suggestions.

22nd 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, market restructuring, sustainability imperatives, policy constraints and technology

Suggested Session Themes and Topics

Sessions are currently proposed in:

Electricity markets: lessons from California

Natural gas markets: demand, supply and prices

North American energy policy: Canada, Mexico and U.S. relationships

Can fossil fuels be sustainable?

**** CALL FOR PAPERS / SESSION PROPOSALS ****

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

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

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

Interested in touring Vancouver?? Visit www.tourismvancouver.com today!!

British Institute for Energy Economics
International Association for Energy Economics

25th International Conference
Exhibition and Conference Centre, Aberdeen, Scotland
June 27th – 29th, 2002

Innovation and Maturity in Energy Markets: Experience and Prospects

***** Call for Papers – Program & Social Activities *****

On behalf of the British Institute for Energy Economics it is our pleasure to invite you to Scotland for the 25th 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.

The conference will bring together a remarkable set of speakers for its plenary sessions. However, the centrepieces of the conference will be its concurrent paper sessions which will form the heart of the meeting. This is the first call for papers for these sessions. Submissions are welcome in all areas of energy economics, but those which lie within the main themes are particularly welcome. The conference has five main themes all of which are important globally:

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.

Abstracts should be between 200 and 1000 words. Details should include the title of the paper, name(s) and address(es) of author(s), telephone, fax and email as well as a short CV. At least one author from an accepted paper must pay the registration fees and attend the conference to present the paper. All abstracts and inquiries should be submitted to: Professor Alex Kemp, University of Aberdeen, Department of Economics, Edward Wright Building, Dunbar Street, Old Aberdeen, AB24 3QY. Tel: 44 (0) 1224 272168, Fax: 44 (0) 1224 272181, email: a.g.kemp@abdn.ac.uk.

The deadline for submission of abstracts is January 31st 2002.

Visit the IAEE website at http://www.iaee.org for the latest information or visit the conference website at www.abdn.ac.uk/iaee

Important Notice: Young Energy Economists Session

One set of concurrent paper sessions will be given entirely to authors under the age of 35. In addition, a prize of $500 will be awarded for the best paper given in this session, plus the refund of the conference registration fees. Please indicate on the abstract if any author is under 35 years old.

Brief Program Overview

Session Topics Under Development Include:

Towards a New Global Energy Policy
The North Sea in a Global Context
Middle East Energy Issues
U.S. Regulation Matters
The Perils of Forecasting
Privatisation

Preliminary List of Distinguished Speakers Include:

Malcolm Brinded, CEO, Shell UK
Peter Davies, BP Amoco
Gerald Doucet, World Energy Council
Michelle Foss, University of Houston
Herman Franssen, Petroleum Economics Limited
Tony Hayward, BP Amoco
Alex Kemp, University of Aberdeen
Lord Lawson
Paul Stevens, University of Dundee

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 serve 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 19th 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 28th there will be a Scottish evening featuring a reception with Scottish food and entertainment.

Cultural Programme

A variety of cultural events will be available. Aberdeen itself has an art gallery and museums (including a Maritime Museum featuring the history of North Sea oil). Within easy travelling distance are many malt whisky distilleries. It is possible to go on a "whisky trail" involving several distilleries within a relatively short time period. The North-East of Scotland is also richly endowed with many castles, some of which date from the Middle Ages. Some are now ruined, but many are in use, including several run by the National Trust for Scotland. It is possible to visit more than one in a day, for example, Balmoral Castle, the Scottish home of the Royal Family, is within easy travelling distance. Aberdeen and the surrounding areas are also very well-endowed with golf courses, including several championship ones, generally open to visitors. The very long hours of daylight in June greatly increase the opportunities available to visitors.

Technical Tours

A variety of technical visits will be available. In Aberdeen itself, beside the Conference Centre, there is a drilling rig used for experimental work. Approximately 30 miles North of Aberdeen there is the recently expanded Peterhead Power Station with a capacity of around 1,500MW. A little further north is the large St. Fergus Gas Terminal. To the south of Edinburgh is the Torness nuclear power station.

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. 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.

Queries:

Professor Alex Kemp
Department of Economics
University of Aberdeen
Edward Wright Building
Dunbar Street, Old Aberdeen
AB24 3QY Scotland, UK

**** CONFERENCE SPONSORS TO-DATE**: Shell, BP Amoco and the UK Department of Trade and Industry **

Managing in the Multicultural World of Oil

*By Carol Dahl and Zauresh Atakhanova**

Managing in global industries such as oil and other energy products requires a wide skill set. A good manager must plan, organize and control by maintaining financial control, building enthusiasm, developing innovative marketing, training personnel, measuring personnel performance, and controlling product quality. Enhancing corporate performance requires closing or modifying failing operations and evolving into new more promising ones.

Often these more promising areas involve an international component as privatization and deregulation of oil markets have caused major flows of international capital. This process is matched by the increasing activity of state oil companies outside their national borders in starting either their own operations or setting up joint ventures with foreign partners. To illustrate the extent of multinational operations from some of the large multinational and national oil companies see Table 1

Increased globalization, as well as increasing attention to ethical & social responsibility, changing demographic and skill requirements, and consideration of employee needs are an important element in management. The manager must not only manage work, organization, production and operations, and technology, but the human dimension including employees and customers. It is this later dimension that requires cultural and social skills when managing across national cultures.

A culture is often defined as the shared values, attitudes, and behaviors of a group. It is more or less their customary ways of perceiving and of doing things. The group may be a nation in which case their culture includes – Language, Ethics, Religion, and Customs. It may be a profession such as Engineering, Geology, and Economics. It may be a particular organization or piece of an organization such as a Foreign Division; a World Headquarters; a Refinery, or an R& D Division. It may be a corporation where cultural types include bureaucratic, centralized, and entrepreneurial. In this paper, space constraints require that we focus on national culture reserving corporate culture to later work.

Culture is learned and national culture is currently accepted in more tolerant circles to be relative, rather than right or wrong compared to some global absolute. However, various dominating cultures across history have felt that their cultures were superior. (e.g., the Ancient Romans, 19th century British, and 20th century American) Within national cultures there is a wide variation in individual values and behavior. For example, suppose the culture trait is how much individualism is valued. Let this trait be measured by an index that goes from 1 to 20 with higher values indicating a greater preference for individualism. Suppose in Figure 1 the left hand probability distribution with a mean of 7 represents Japan and the right hand distribution with a mean of 15 represents the United States. In this figure, on average the U.S. values individualism more than the more group oriented Japan. Knowledge of such differences in cultural norms can be useful when trying to decide how to motivate personnel in various cultures and how to organize work assignment across individuals and teams.

Table 1: Large Integrated Oil Companies International Operations

Multinational Company	Number of countries it operates in
Exxon Mobil	>200
BP Amoco	>100
Texaco	>150
Chevron	>100
Conoco	> 40
Shell Oil	135
Phillips Petroleum	> 20
Occidental Petroleum	9
TotalFinaElf	40
National Company	
Saudi Arabian Oil	6
Petroleos de Venezuela	3

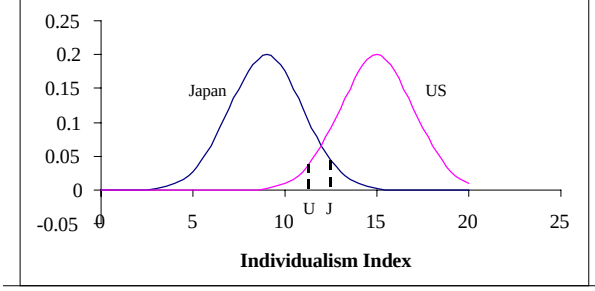
Table Note: > indicates more than

Understanding such differences allows managers to avoid misunderstanding and to use differences to their competitive advantage. Nevertheless care must also be taken to not stereotype individuals since wide differences exist within cultures as well as across cultures. For example in Figure 1, the Japanese individual represented by J values individualism more than the American U.

The two most often cited authors that classify cultural differences particularly relating them to the corporate world are Hofstede (1984,1991) and Trompenaar (1993). Hofstede notes four cultural elements in work related activities: Power Distance, Uncertainty Avoidance, Individualism/Collectivism, and Masculinity/Femininity. He conducted a huge survey of IBM employees in 50 countries and ranked their cultures based on these criteria.

Power distance represents the degree of equality in a group. Cultures vary by how authority is distributed within groups. The more hierarchical and centralized the management of the group, the larger the power distance. Power distance is higher if the boss's decision is accepted right or wrong. In high power distance contexts the manager is viewed as an expert, in a low power distance context the manager is viewed as a problem solver in conjunction with the group. Egalitarian managers in high power difference contexts may be viewed as weak and incompetent or employ-

Figure 1: Cultural Preferences for Individualism



* Carol Dahl is Professor in the Division of Economics and Business at the Colorado School of Mines. She is also Director, CSM/IFP Joint International Degree Program. Zauresh Atakhanova is a Ph.D. student at the Colorado School of Mines.

ees may interpret managers help as a signal that the employees are doing poorly, whereas authoritarian managers in a low power distance context may be viewed as dictatorial. Thus, managers with a more egalitarian approach may not work as well in Latin America, Arab countries, and Indonesia, which tend to maintain more power distance, than in the more egalitarian N. Europe, United States and Canada. Even within Europe we see differences. In a BP Finance Office, the Germans tended to be more hierarchical, the Dutch, Scandinavians and British were more likely to challenge authority, while the French accepted management authority more or less as their right and obligation. (Hoecklin 1995)

Uncertainty avoidance represents attitudes towards risk. Countries with high uncertainty avoidance, such as Japan, Catholic Europe and South American are more uncomfortable with ambiguity, dislike conflict in organizations and prefer formal rules. Those with low uncertainty avoidance, such as Singapore, Scandinavia, Canada, the United States and the UK deal better with ambiguity and change and are more likely to take risks for commensurate rewards. Long-term job security tends to be important in high uncertainty avoidance cultures; managers are more likely to be chosen by seniority, and rules should not be broken even for good reasons. Whereas in low uncertainty avoidance cultures job mobility is higher, managers are more likely chosen by merit, and there is more flexibility and judgement in interpreting and breaking rules.

Questions such as "who am I?" and "How do I relate to others?" have to do with the concept of individualism and collectivism. In the most individualistic cultures in Hofstede's survey - the United States, Australia, and the UK - the interests of the individual are central. Individual initiative and leadership are valued. People are permitted and expected to have their own opinion and a private life. Promotion is more likely based on merit and individual accomplishment. In collective societies, which are in the majority, the group is more highly valued and the individual receives value from being a member of the group. Private life and private thought are more likely determined by the group. In return the group is responsible for taking care of its individual members. Promotion is from within the group and tends to be based on seniority. Socialist countries in the past were, of course, very group oriented as are many East Asian and Latin American countries in Hofstede's sample. Thus a brash individualistic American management style may fall flat in Asia or tribal Africa where the group defines the individual and consensus is important.

Adler (1997) suggests that each orientation has its advantages. Groups tend to be better at establishing objectives and evaluating and choosing alternatives to meet those objectives whereas the individual tends to be better at coming up with objectives. Also each orientation tends to work better depending upon the individuals cultural background. For example, Earley (1989) found that Chinese working anonymously in a group performed administrative tasks better, whereas Americans performed the same administrative tasks better when working separately with personal attribution of the tasks.

Masculinity/femininity considers how important masculine values such as assertiveness and success are relative to feminine values towards relationships and nurturing and how important gender is in the business world. More masculine societies tend to have tighter specifications of gender specific activities, more industrial conflict, and higher stress levels. A business women in the mostly masculine dominated OPEC countries faces special sets of problems not as prevalent in the more feminine cultures of Scandinavia.

Grays's book *Men are From Mars and Women are from Venus* categorize's some of these stereotypical gender traits and suggests ways to deal with the differences in a personal relationship context. Hines (1992) in a somewhat similar vein uses a Yin/Yang framework. Yin values are sharing, relatedness and kinship while Yang values are quantification, objectivity, efficiency, productivity, reason and logic.

In addition to the above list of cultural indicators, Hofstede and Bond (1988) adds an indicator called Confucian Dynamism. It is particularly important in understanding and functioning in Asian cultures and relates to a culture's orientation across time. Confucian values place a high importance on a long run orientation and the Confucian work ethic favors thrift and persistence in putting off current gratification for longer term gain. A longer term focus also suggests that the individual may be more likely to submit to the group and its hierarchy and have a sense of shame. Shame in this context is outer based and relates to group approval. In more individualistic cultures guilt or self approval may be more important.

Trompenaar suggests a second way that cultures view time. Events may be considered sequential (monochromatic) or synchronous (polychromatic). In sequential cultures things are done one at a time in sequence; appointments and plans are closely adhered to. In synchronous cultures many things may be done at once, appointments and plans change, relationships are important. A sequential person from the U.K. may be a bit disoriented by all the interruptions in a meeting with a synchronous Arab who will stop the meeting with many interruptions.

We also add to the above list four out of five of Trompenaar's concepts dealing with relationships with people. Universalism/particularism, neutrality/affectation, diffusion/specificity, and achievement/ascription. Universalists believe that there are norms, values, and behavior patterns that are valid everywhere, whereas particularists believe that circumstances and relationships determine ideas and practices. In universal cultures such as the United States, UK, Australia and Germany there is more focus on rules and formal procedures such as detailed contracts. In more particularist cultures such as China, Indonesia, the CIS (countries of the Former Soviet Union) and Venezuela, relationships are more important with contracts and relationships being modified over time. For a particularist culture, small talk and socializing are part of the 'getting to know you' and trust building process. For a 'lets get down to business' universalist culture, such activities might be considered a waste of time. Contracts can obviate the need for trust to a universalist, whereas the detailed contracts of a universalist might signal a lack of trust to a particularist.

Along somewhat similar lines Barber (1996) looks at McWorld versus Jihad. From the McWorld point of view, the world is one large market connected by high information networks moving towards automation and homogenization. Transnational and multinational capitalist companies, that

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Managing in the Multicultural World of Oil *(continued from page 7)*

use large amounts of natural resources, serve a global market. McWorld is associated with occidental, particularly American culture. Jihad is the point of view that fights against modern capitalism and clings to religious beliefs, ethnic traditions, local and national communities. Jihad elements in a culture increase the risk for capitalists doing business in them. Twenty four percent of the world's oil reserves are in risky areas where Jihad beliefs are prevalent. McWorld values and promotes economic well being but not necessarily social and political well being, while Jihad promotes community but is often intolerant. Barber suggests that the optimum is to take the best from McWorld while still maintaining a cultural identity and sense of community from Jihad. He believes that Japan and China have been reasonably successful at doing just that. Alternately McWorld managers in Jihad cultures need to pay special attentions to indigenous groups and cultures.

The neutral/affective trait considers how emotions are expressed. In neutral cultures such as Japan, the UK, Singapore, and Indonesia expressing emotions, particularly intense emotions, is viewed with disfavor and is considered unprofessional. More affective cultures such as Mexico, the Netherlands, China and the CIS are much more comfortable with the expression of emotions in public and may consider those from neutral cultures as cold or deceitful.

Specific/diffuse relates to how a culture views private and public relationships. An individual has a public space presented to everyone and a private space or part of their personality which they share with selected individuals. In a specific culture such as Australia, the UK, the United States, an individual has a small private space, which is compartmentalized from the public space. The public space is easily entered. In a diffuse culture such as China the private space is larger and less compartmentalized. Thus, it is harder to enter someone's public space in a diffuse culture because it allows easier entrance into their private space. Diffuse cultures may seem cold to those from a warmer specific culture.

Earlier in Hofstede's equality category, he explored how power and authority vary across a group. In Trompenaar's category, Achievement/ascription, he explores how power and status are attributed to members of the group. In an achievement culture such as Australia, the United States, Switzerland and the UK one's status is determined by how well one performs desirable functions for the group. The emphasis is on task. Status and power in an ascriptive culture is more "who" you are than "what" you are. Status and power is conferred by things often ascribed at birth – gender, family, and social connections. More ascriptive cultures include Venezuela, Indonesia, China, and the CIS, where the emphasis is more on relationships than achievements. However, since these same cultures emphasize relationships, this power base may be perfectly legitimate since their ascriptive status and power may enable them to get things done just as achievements do in an achievement culture.

Humans' relationship to their environment may vary by the degree of control they feel they have over their destinies. Trompenaar designates cultures whose members feel that they are in control of their fates as "inner directed," while those that feel they are merely pawns in the game controlled by fate are "outer directed." North Americans and Europeans tend to be more inner directed, where the Arab's "Inshallah" or "God willing" after statements of coming events suggests a more outer directed view of the world. Native Americans would also fall more in the category of believing in fate.

Hall and Hall (1984) note that personal space and territory vary across cultures. Japanese stand further apart than North American's, who in turn stand further apart than Middle Easterners and Latin Americans. Latin Americans touch more frequently than either North Americans or Japanese. Greetings vary, as well, as noted in the title of the book Kiss, Bow or ShakeHands. Learning and respecting personal space and greetings can pay cultural dividends in business dealings. A reference that gives information on greetings, introductions, how to make contact, how to set appointments, negotiating, views on time and other useful tidbits can be found at:
http://businessmajors.about.com/education/businessmajors/gi/dynamic/offsite.htm?site=http://www.getcustoms.com/omnibus/dba.html A reference that makes suggestions for culturally appropriate gifts is:
http://businessmajors.about.com/education/businessmajors/gi/dynamic/offsite.htm?site=http://www.getcustoms.com/omnibus/dba.html

The extent of ritual varies across cultures as well. Asia tends to have high ritual cultures where behavior tends to be more structured and to follow set rules. For example, in Japan rules govern gift giving including the gift, the manner of presentation, the manner of acceptance, and how the gift receiver reciprocates. Another example is giving out of business cards in Asia. The card is presented with ceremony and is not to be shoved in the pocket after a glance by a low ritual savage from the West, who has more ambiguous rules of social behavior and a wider range of acceptable behavior.

Adler (1997) notes various cultural conceptions of human nature. Cultures that view people as basically good tend to trust people until they are proven untrustworthy. While cultures that view people as basically evil tend to use safe guards to protect themselves from people until they are proven trustworthy. Christians tend more towards the first view and Buddhists more towards the later. Other cultures may be neutral or believe that each individual varies in his or her moral character. Such character is believed to be changeable by some and fixed by other cultures. If humans are changeable as the Chinese believe, they will spend more time and effort on training and encouraging personal improvement. If personalities and qualities are more immutable (You can't teach an old dog new tricks) more resources will be spent on selection and screening as is done in the United States.

Cultures vary in how they see the world and nature. They may feel they dominate, are in harmony with or are subjugated by nature. Some cultures may view the world as stable and predictable and others view it as random and turbulent. Western cultures are more likely to feel that they dominate nature whereas Eastern cultures may want to be in harmony with nature. For example, the Chinese practice of Feng Shui believes that by knowing natural laws and cycles you can harness energy that flows through all things to be in harmony with nature. Form, shape, and, particularly, spatial alignment are used to bring the environment into alignment with

natural energy flows. Thus, in a Far-Eastern environment office furniture alignment and location are important considerations for a smoothly flowing office and should not be left to chance.

Another aspect of a human relationship to nature according to Kluckholn and Strodbeck (1961) is their orientation towards activity or the purpose of work. Their three points of view are doing, being, or becoming. Doing cultures, such as the United States, focus on outward accomplishments for tangible rewards. Being cultures, such as the Latin Americans, enjoy the here and now, and tend to be more spontaneous. They are more likely to accept circumstances and try to make the best of them, rather than changing circumstances. Becoming cultures focus more on the inner rewards of personal growth and self actualization often associated with meditation and spiritual growth featured in Buddhism and Hinduism.

Understanding a culture's relationship to nature and work often helps in motivating employees. Two management theories are associated with these concepts. Theory X suggests that people dislike work but are motivated by basic needs of safety and security. In this doing context, a manager directs, controls, and coerces employees to get the job done. Theory Y maintains that people are motivated by achievement and self actualization. In this becoming context, employees will work towards things to which they have a commitment. Managers should seek to motivate and then step back allowing the employees to grow and develop as they move towards their goals. Adler (1997) notes some of the advantages and disadvantages of the more decentralized Theory Y. Decentralization encourages decision making and problem solving skills, improves creativity and job satisfaction. It can, however, require more expensive training, higher quality employees, increased information flows and a need to develop accountability measures.

Communication is another area where misunderstandings and problems can arise across cultures. There are a number of aspects to communication. At the verbal level there are three components – "What you say?" "What you mean?" and "What the listener understands?" What you say may be interpreted differently in two cultures because of differences in meanings of two words across cultures. For example, an Irish person who is pissed is drunk, whereas as a North American is angry.

Cultures have their own icons in the form of symbols, heroes, and rituals that represent underlying values. Idioms, similes and metaphors that represent these icons may convey meanings and emotions that do not translate across boundaries. Cowboy images may not be meaningful to a Japanese person. Samurai images may not translate from east to west. One of my Egyptian students looked at me quizzically when I said "Don't throw the baby out with the bath water." Throwing babies around did not seem to be an appropriate ritual to him.

Words may have different meanings in different contexts. For example the statement "Bill Clinton was born in Hope and grew up in Hot Springs" translated into Italian and back by Altavista's machine translation service reads "The invoice Clinton has been taken in the hope and it has been developed in warm motivating forces." A Chevy Nova did not sell well in Mexico since *no va* in Spanish means doesn't go. Nor does one expect that the Iranian laundry soap *Barf* would sell well in the United States. Also the same word may reflect different values. When in Nepal I was told they were cremating an important person on a funeral pyre along the river. When I referred to this person as rich, I was immediately corrected. The person was holy or blessed not rich.

Hall and Hall (1990) refer to low context and high context situations and cultures. In a low context situation both parties know little about the context and nothing can be taken for granted. Everything must be spelled out. For example, the following sentence would not make sense in a low context situation. "This book describes step-by-step procedures for setting up a DHCP server, securing your intranet with a firewall, running on an alpha system, and configuring your kernel." However, an advanced Linux operator would know exactly what is meant. In a high context situation the two parties already have the context and very little needs to be spelled out. Cultures which are more homogenous and well connected such as the Japanese, Arabs, and Mediterraneans are typically high context cultures. Cultures that are more individualistic and have more compartmentalized lives such as the North Americans and other northern Europeans are typically lower context. Explaining too much in a high culture context may be taken as condescension, explaining too little in a low context culture may lead to lack of understanding.

Adler (1997) suggests that words communicate 7% of meaning, tone of voice 39%, and the rest is conveyed through nonverbal means such as gesture, posture, and facial expression. The nonverbal portion may re-enforce, contradict, or help clarify the verbal portion. If the nonverbal actions contradict the verbal, the nonverbal is more likely to be the true signal. That is, if the nonverbal signals mean the same thing in the two cultures. In some cases nonverbal signals may be the same across cultures – often a smile is a greeting, a frown a signal of displeasure. At other times they are not. Nodding ones head up and down means *no* to a Bulgarian, *yes* to an American and *I'm listening* to a Japanese. A North American may feel that someone who will not look you in the eye is shifty but may find the length of eye contact by an Arab aggressive. A Chinese or Japanese, however, feels that direct eye contact is rude. (For a dictionary of non-verbal communication in the United States see http://members.aol.com/nonverbal2/entries.htm#Entries)

Paying attention to these verbal and non verbal nuances, and shared cultural traits can be especially important to a successful advertising campaign. Observing advertising from another culture can also provide useful information on that culture's values.

A last dimension of culture that will be briefly mentioned is political culture. Democratic market based industrial economies typically function under rules of law with the generally accepted notion that if everyone acted within the law, the society would perform reasonably well. Centrally planned command economies were faced with the complex task of trying to produce and allocate goods and services to millions of people. Strict central planning and adherence to the plan became the accepted norm. Economic incentives were not built into the system leading to weak motivation for work, shoddy products, shortages and queues. The task

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Managing in the Multicultural World of Oil *(continued from page 9)*

became harder and harder as the products became more complex and consumers more sophisticated. In such settings, those who side stepped the legal channels helped make an impossible system possible. Thus getting around the system rather than working within the system became an accepted activity. Theft at factories was rampant. After all, it wasn't really theft since it belonged to everyone.

With the fall of the USSR, western economists naively thought that privatization, liberalized prices and markets would fix the problems of the planned economies in short order. Instead, powerful elites took control of the government and economic resources and the mafia and corruption became pervasive in the economy. Western laws were transplanted without the institutions or political will to enforce them. In the absence of the checks and balances developed over centuries in the West, crony, rather than liberal capitalism evolved much like the age of the Robber Barons in the United States. Interpersonal relationships and connections become especially important in dealing with these and other corrupt cultures.

Conclusions

The above cultural differences have implications on corporate behavior in various cultures. Adler (1997) indicates that they help determine the following:

- Who makes decisions?
- How fast or slow are decisions made?
- How much risk should be taken?
- How problems are to be viewed and solved? A westerner is likely to view life as a series of problems to be solved using scientific and analytical thought. An American might be more likely to use induction and trial and error, a French person may be more likely to use deduction and a linear conceptual approach. An easterner might is more likely to view life as a series of situations to be accepted and synthesized rather than analyzed, and multiple truths are accepte.
- How decisions are made? An Oriental from Japan or China would be more likely to take a more holistic approach that considers all the alternatives. An Occidental from the United States or Germany would be more likely to take a sequential approach and make incremental decisions.
- How decisions are implemented? An important implication of how decisions are implemented depends on the ethical, institutional and legal framework in the operating country. Environmental standards vary across countries. A gift may be a bribe in the United States a normal part of business in Korea. Labor unions may negotiate national contracts in some countries, but not in others. Cartels may be illegal some places but encouraged in others.

Cultural differences also impact upon negotiations. The style may vary with the underlying values and assumptions of the culture and might be based on fact and logic, emotion, or ideals. Ritual may influence the opening offer, the amount of conflict, the size and timing of concessions, and the response to concessions. The autonomy and number of the negotiators is often related to the power structure and individualist tendencies of the culture.

Cross cultural joint ventures, mergers and teams must learn to move forward together. Some ingredients in the recipe for success are as follows: Clearly identify the end goal. Contrast and compare the way each culture or company would approach the goal. Assume differences until similarity is proved. Look at what is said and done rather than interpreting it. Choose the best approach or some better amalgam of the various approaches. Monitor feed back and continue to adapt.

Companies as well as nations have cultures. These cultures have many of the same dimensions as discussed in this paper at the nationally level. With recent mergers, privatizations, and a number of national oil companies going international, many companies are finding the need for disparate corporate cultures to adapt to each other. Space constraints require, however, that we leave the discussion of corporate cultures to another time and place.

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Restructuring The Oil Industry in the Middle East

*By Paul Stevens**

The Context

This paper outlines some of the main developments in changes to the upstream oil sector in the Middle East. The focus of the paper is on three countries – Iran, Kuwait and Saudi Arabia. Restructuring has three dimensions. The reform and reorganization of the national oil companies (NOCs); the opening of upstream oil (and gas) to the international oil companies (IOCs); and finally talk (rhetoric?) about privatization of the oil sector.

The subject is clearly important. For the countries of the region, despite attempts at diversification, oil remains the key to economic health. In all cases, there are extremely powerful government spending multipliers which drive the economies. Fluctuations in oil revenues, driven by price change or export volume change, are directly and quickly reflected in the state of the general economy. Furthermore, the health of these economies is a crucial factor in their ability to meet the challenge of rising unemployment. An inability to meet the expectations of their growing young populations is likely to have serious political consequences.

For the oil consumers of the world, the region and the state of its oil sector also is key. It remains central to the prospects for oil supply and the stability (or otherwise) of oil prices. The Middle East accounts for around half of the world's traded oil and some two-thirds of proven oil reserves. If the consensus forecasts are to be believed –a very dubious option – this key role in world oil is likely to continue and the region's dominance increase.

The Drivers of Restructuring

The process of restructuring is being driven by a multitude of factors. Although these appear similar between the countries. In reality, they are subtly different. The factors can be classified under three headings –ideology; the need for capacity; and the need to lock-in political support.

Ideology

The driver of ideology is derived from developments in economic theory over the last thirty or so years. In particular, the areas of economics known as "theories of public choice" and "principal-agent analysis" have been extremely important. In essence, these ideas argue that bureaucrats in state owned enterprises such as an NOC will absorb rent for their own use to improve their working environment. This carries many implications. For example, if the objective of the bureaucrat is to maximize their budget allocation, and if what is produced faces an inelastic demand, greater efficiency and lower costs simply means smaller budgets. Taken to its logical conclusion, the implication is that the bureaucrat has a vested interest in being high cost and inefficient.

Such activities are disguised because the bureaucrats (the agents) are the only ones capable of knowing exactly how much activities cost. Those who are supposed to be controlling the agents –the politicians (the principals) cannot know precisely what is going on. The agents are allowed to expropriate rent because there are information asymmetries. It has been argued that the reason NOCs bought into the downstream outside their own countries was to deepen these information asymmetries. This would allow greater rent capture by the NOC. Despite the rather abstract and theoretical orientation of these ideas, they are remarkably powerful in the region. This is true even in Iran where ideas of western economics perhaps have less currency than on the Arab side of the Gulf peopled by recent graduates from U.S. and European university economics departments.

To be aware of the extent of these information asymmetries, the principals need much greater transparency in terms of explicit market transactions and benchmarking. To solve the problem, the principal needs accountability of the agent. This, of course, is what privatization is supposed to achieve. When the principal becomes a shareholder, it is a simple matter for them to check on the performance of their management by simply reading the financial pages of the papers each day to observe what is happening to their share price. Information asymmetries disappear under the transparency provided by the stock market.

In the context of restructuring the oil sector in the Middle East, securing IOC entry is seen as providing a benchmark against which to compare the performance of the national oil company. Eventually, the problem might be solved by an outbreak of privatization where the incumbent NOC must compete with the IOCs.

The Need for Capacity

The consensus view of growing dependence on Gulf oil receives widespread belief in the region. Indeed, in many quarters there is great complacency because it is believed eventually the world will need more Gulf oil. However, outside of Saudi Arabia, there is little current excess capacity to produce that oil. Indeed in both Iran and Kuwait, the sector is struggling to maintain existing capacity. In Iran this reflects financial constraints in the face of mature fields which urgently need major attention to maintain their recovery rates. In Kuwait, it reflects managerial constraints following the loss of much of the expatriate workforce in the sector after 1990. In both countries, there is also a shortage of technology in a context where the post 1986-technological revolution in oil production techniques has transformed the sector in other parts of the world.

One obvious mechanism to solve this capacity problem is to persuade the IOC's to provide the capital (needed in Iran but not in Kuwait) and the technology (needed in both Iran and Kuwait). While it is true that much of the "technology" can be provided by the service companies; in reality, what is needed is the IOC's ability to manage large projects and to coordinate and incorporate the technology. Some might argue this is also true in Saudi Arabia although Saudi Aramco would bitterly deny this.

The Need to Lock-in Political Support

Locking-in political support is relevant for all three

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Restructuring Mideast Oil *(continued from page 11)*

countries although for rather different reasons. In Iran, in the early 1990s there was a growing view amongst some that it was time to try and end Iran's international isolation. One way of doing this, and to provide a counterweight against U.S. pressure, was to try and encourage IOC entry. In the case of Kuwait in the early 1990s it was clearly the prospects of putting the IOC's between Iraq and Kuwait City which prompted the opening of the northern fields to the IOCs. In Saudi Arabia, the issue emerged much later. It was concern in late 1996 and early 1997 that the Kingdom would no longer be able to buy U.S. arms on the scale which had become common in the previous 25 years. Hence the question arose as to what other mechanisms might be found to ensure continued U.S. support for Al Saud.

The Case Studies

Driven by these concerns. The restructuring took three forms. The reform of the national oil companies was intended to improve transparency, accountability and ultimately efficiency, to allow more rent to accrue to the state. The opening to the IOC's was intended to bring in capital, technology and political "links" and, at the same time, to provide a means of benchmarking. Finally, the prospect of privatization was seen as a means to improve oil sector efficiency although there was also an element of satisfying the fashion. Privatization had effectively become the mantra to chant as a means of paying lip service to economic reform.

Iran

The Iranian story begins in 1977-78 when OSCO –the main oilfield operating company - developed a major programme of secondary recovery. This was designed to try and prevent Iranian production –then at some 5.5 million barrels per day (mbd)- from facing serious decline. However, the plan, which required considerable quantities of natural gas for injection, was delayed first by the revolution and then by the Iraqi invasion and subsequent war. After the end of the war the National Iranian Oil Company (NIOC) began looking again at the plans as they struggled to meet their OPEC quotas. They realized that one solution would be to engage the IOCs to provide the capital and technology. This coincided with the decision to open Iran to greater links with the outside world. The two together, coming from different parts of the technostructure, created a serious effort to encourage IOC entry.

However, progress was slow. Initially Iran had very unrealistic notions of what the IOC's would find attractive. In the early 1990s the terms of the buy-back option, designed to get round constitutional constraints on foreign access to oil or gas, was simply unattractive to the IOCs. When this was realized and a more realistic bargaining stance was adopted, the process ran foul of the 1996 U.S. Presidential Executive orders and the Iran-Libya Sanctions Act which certainly slowed the process. Limited progress also occurred because the nature of the buy-back contract required careful negotiation and scrutiny of individual clauses. This process was made the responsibility of NIOC's International Affairs Department which simply did not have sufficient people with knowledge or experience to manage a large number of such negotiations. In 1997-98 Iran began to push the buy-back option with a series of high profile meetings abroad to allow IOC entry on a major scale but progress was still slow.

In 1999, NIOC was completely restructured. There were two problems with the process. First, it was done on an internal basis with no outside advice. The inevitable result was that internal vested interests caused many unhelpful decisions. Second, the decision was made to greatly fragment NIOC but with little or no thought as to how the bits would interact together. The result was serious problems for the oil sector which are still in the process of being sorted. Meanwhile the buy-back negotiations continued. Some agreements were signed but within Iran it was generally agreed, at least in private, that progress was disappointing. There was a fundamental problem. Neither side to the negotiations had much real enthusiasm for the buy-back concept. The IOC's felt they were unattractive because they offered little upside benefit and much downside risk. They went along with them because entry to Iran was perceived to be worth initial loss leaders. Elements in NIOC on the other hand felt that they were unattractive to the IOC's and rather cumbersome. These elements felt production sharing contracts would be more acceptable despite constitutional constraints. With these attitudes on both sides, each hoping for something better, progress in negotiation was inevitably slowed. However, for the time being buy-backs were the only game in town although after the new Majlis was installed in May 2000, there was a brief newspaper campaign suggesting that buy-backs might be superseded by some form of production sharing arrangements.

However, the new Majlis suddenly started to take angreater interest in the terms of buy-back contracts. The issue began to be used by the conservatives as a means with which to beat the liberal reformers. Voices were increasingly heard that too much was being given away. More information was demanded. At the same time, responsibility for the negotiations had been switched from International Affairs at NIOC to a new body – PEDEC. Inevitably, this delayed the negotiations even further as PEDEC sought to establish its position. In November 2000, the Oil Minister announced new terms for the buy-backs –the terms had continually been revised in recent years in an effort to raise greater interest from the IOC's. At the time, he heralded this as offering more attractive terms but in the event, many of the changes offered were actually disadvantageous to the IOC's.

The process is still ongoing but progress remains slow and is likely to fall foul of the internal political battle being waged in Tehran.

Kuwait

In the immediate aftermath of the liberation in 1991, the decision was taken to try and encourage IOC entry. Al Sabah wanted it to try and bolster their position vis a vis the allies. The Kuwait Petroleum Company (KPC) wanted it because they were desperately short of management skills given the loss of so many expatriates – several IOCs had been invited in to act as contractors as KPC tried to sort out the horrendous aftermath of the well fires. In 1994, a ministerial decision created a committee to investigate the options. Proposals emerged in the following year but these came under fierce attack from elements in the National Assembly and were actually rejected by the Supreme Petroleum Council (SPC). This was the ultimate formal arbiter of policy although it was

Al Sabah who effectively took any final decisions. In August 1998, KPC underwent major restructuring. The upstream (the Kuwait Oil Company) and the downstream (Kuwait National Petroleum Company) were created as separate divisions while the Petrochemical and Tanker companies were "prepared" for privatization. During 1998-99, details began to emerge of what became known as Project Kuwait which was a detailed plan for the IOCs to be involved in the further development of the Northern fields. This was part of a wider programme to try and expand Kuwait's crude producing capacity.

The culmination of this early process was a grand conference held in Kuwait in November 1999. This was intended by the government to provide a showcase of what was on offer. However, a consistent problem ever since the opening was mooted was the insistence of the National Assembly that any IOC involvement would require special legislation from the Assembly. Implicit in this was that the Assembly should have control of the process; a view strongly denied and resisted by the government. It was this debate which effectively dominated the conference. The IOC's attending were virtually ignored by all and the proceedings effectively turned into a debate over who ruled Kuwait.

The outcome was acceptance by the government of the need for legislation. However, this proved to be a recipe for disaster. Not only did the National Assembly compete and challenge the government at every opportunity. The government itself was divided reflecting deep seated family divisions. Legislation was put to the Assembly but the process of Committee review and subsequent debate was tortuous in the extreme. Opposition derived from several sources. There was a general hostility by many of the Deputies to any foreign company involvement in the sector. A legacy of the past history. From others, there was concern over the potential for corruption if decisions in the process were left to government. Finally, many Deputies, not understanding the nature of the modern international oil business, simply argued the IOC's could be kept on as contractors. The process of trying to formulate the legislation drags on with little sign of progress. Meanwhile, the IOC's are rapidly losing patience and it is not inconceivable that some may actually pull out of the process altogether.

Saudi Arabia

The process in Saudi Arabia effectively began in January 1997. Prince Sultan, Minister of Defence, visited Washington to discuss with the Saudi Embassy the possible consequences of significantly reduced arms purchases by the Kingdom from the U.S.. This gave an opportunity to Saud Al Faisal to get involved in the process. He was the Foreign Minister and someone very close to Crown Prince Abdallah who de facto was rapidly becoming ruler in place of the ailing King Fahd. In mid 1998, Saud Al Faisal produced a position paper on fundamental reform of the economic situation in Saudi Arabia. This very radical document which talked of "smashing icons" had as part of the strategy an opening to IOC involvement in the economy of the Kingdom in an effort to generate more jobs for the ever growing number of young Saudis entering the job market.

In September, CP Abdallah – who had accepted the position paper – visited Washington and invited the CEO's of a number of the major U.S. oil companies to come up with proposals for investment in the Kingdom.

By December 1998, the various offers and proposals began to come in. It was announced that investment in upstream gas was to be allowed but that oil, for the time being at least, was excluded. In September 1999, a special committee was created to asses these proposals. There was, however, a very basic problem. Saudi Aramco and Ali Naimi, the oil minister, (and former CEO of Saudi Aramco) had been horrified when they learned of the intentions to involve the IOC's. They felt hurt and insulted by the proposal. They feared the consequences if they were asked effectively to compete with the IOCs in a context where they, as the NOC, would be forced to take account of public interest issues which the IOCs could ignore. However, at the same time, only Saudi Aramco contained the expertise capable of seriously evaluating the IOC proposals. Representatives of the oil establishment dominated this evaluation committee.

Meanwhile, Saud Al Faisal was out of action due to illness and the process virtually stalled. In January 2000 he returned and the Supreme Petroleum Council was revived as the body responsible for policy in the oil sector and with control over Saudi Aramco's budget. This Council was dominated by non-oil establishment members. During the remainder of 2000, the various bids were evaluated. In May 2001, the successful bidders were announced. Memoranda of Understanding were signed to allow more detailed negotiations to proceed. However, it is becoming clear during these negotiations that Saudi Aramco is fighting a serious rearguard action to slow the process by constantly shifting negotiating stances on a number of issues.

Conclusions

In all cases, the process of restructuring and opening is stalled and delayed although the reasons differ between the three countries. Also the prospects for solution differ. Saudi Arabia will eventually open and the oil establishment will be tamed. Kuwait probably will fail to resolve the underlying issues which have more to do with the governance of Kuwait than oil. In Iran the outcome could go either way depending upon the result of the ongoing battles between the conservatives and the reformers.

Meanwhile, the world goes on and other options begin to open to the IOCs. The Caspian appears to be more promising than a few years ago. There is also the possibility of smart sanctions opening the Iraqi upstream. Vice President Cheney's Energy Task Force has also perhaps revived prospects in the U.S. upstream.

This raises the issue of what motivated the IOC's to respond to the offer of entry from the Gulf? There was a clear industry consensus that access to the Gulf upstream would be good for shareholder value in a world where it was becoming increasingly difficult to deliver such value. At some point, it is possible that the IOC shareholders might realize that access to low cost oil on difficult and unattractive terms may not be the panacea they first thought. It could be that by the time the Gulf countries sort their problems over greater access, IOC interest may well have significantly cooled.

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OPEC's Challenge

*By William R. Edwards**

OPEC's logo features "Cooperation" and "Stability". During the past few years, cooperation among the member countries has been outstanding. However price stability has been the worst we have seen at anytime during OPEC's history, except during times of major disruptions.

What is the reason for OPEC's inability to achieve price stability? It is certainly not from a lack of cooperation. The OPEC member countries have shown a remarkable ability to comply with the quotas that have been agreed upon at the various meetings. Compliance has been good both for production cuts and for production increases. It would be hard to expect a greater degree of compliance than what has been experienced. In spite of this, however, price volatility has increased rather than decreased.

In the time period 1991 through 1995, WTI prices ranged from a low of $14 to a high of $24, a difference of $10 per barrel. In the past five years, however, prices have varied nearly three times as much, from a low of $10 to a high of $37, a difference of $27 per barrel. Even within this range there has been an increase in short-term volatility. For example during the month of December 2000, there was a $10 per barrel difference between the low price and the high price for this month alone. Obviously the production adjustment mechanism that OPEC has adopted does not contribute to price stability. In fact, on the contrary, this mechanism leads to greater price instability.

What is the fundamental reason behind this increased volatility? All of the superficial answers to this question can be ruled out. For example cheating is not a factor. And although we might attempt to put the blame on inaccurate forecasts or reporting, this can not be the case since price volatility has been great in both directions. In order to arrive at an answer we must look more carefully at the mechanism by which petroleum prices are determined.

It is well known and universally accepted that futures prices as determined by the New York Mercantile Exchange (Nymex) are a major factor in current petroleum pricing. In fact, correlations suggest that the Nymex now sets the price and the producing countries simply follow this price. We all recognize the extreme volatility that can occur on any commodity that is traded under a highly leveraged environment. When small moves in price create large demands on the financial assets of the participants, we can expect knee-jerk reactions on the price that these participants are forced to pay. Such is the case with oil futures prices on the Nymex.

The futures market has a free hand in pricing most of the time. Futures prices can move up and down at will, not effected at all by real world oil fundamentals. However, if inventory levels approach either a full or empty tank situation, the real oil world imposes its will on the futures market. If inventories are at tank bottoms, prices will exhibit an upward trend. If inventories are so high that more oil cannot be accommodated, prices will exhibit a downward trend. However, it is very rare for either of these circumstances to exist.

WTI FUTURES PRICE

The case of completely full tanks has never existed in the past 40 years. Likewise, the case of completely empty tanks has never existed. However, tanks do not have to be physically empty for the "empty tank" situation to exist. If inventories fall to the minimum operating level, which, incidentally is far above tank bottoms, an upward pressure on prices will result.

This upward pressure on prices is not a subtle, smooth effect. It is an erratic, jumpy effect. This is what we now have.

Although reported inventories, worldwide, of three billion barrels sounds like a lot of free oil, this is not the case. When you factor in tank bottoms, pipeline fill and tanker capacities,

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the three billion barrels turns out to be a minimum requirement. Thus, practically speaking, three billion barrels is "empty".

For purposes of illustration, let us look at the inventory situation in the United States. Commercial inventories of crude and product usually amount to about 1100 million barrels. The normal seasonal fluctuation is about 100 million barrels. This is shown in the figure below where commercial stocks are shown for the past twenty years.

The years 1995 and 1999 stand out in this chart because the inventory levels dropped in those years to the 900 million barrel level. Each of those years produced a significant increase in price in the next year. The year 2000 performed similarly. And the erratic price jumps that we are now experiencing are confirming again that the 900 million-barrel level for the United States represents "empty tanks". Thus it should come as no surprise that OPEC's production cut in the 2001 winter should create a surprisingly sharp run-up in prices. Had not President Clinton transferred 30 million barrels of oil from the government's emergency reserves into commercial storage during the fourth quarter of 2000, the price rise would have been even more spectacular.

The OPEC production restraint, by definition, creates an "empty tank" environment. From OPEC's standpoint, the resulting upward price trend is a desirable result. However, the concomitant elimination of operating cushion adds to the erratic, sharp moves already characteristic of a futures-driven market. This is the reason for the increase in volatility since OPEC decided to control prices through the mechanism of production restraint.

It is popular for oil producers to place the entire blame for the current extreme price volatility on the futures market. While it is true that the futures market contributes greatly to the magnitude of the price swings, it is inappropriate to place the entire blame for this situation on oil futures. Further, had not the pricing function been relegated to the futures market in the first place, the role of the Nymex in this increase in volatility would never have been a factor.

OPEC must return to a system that allows a consistent and adequate supply of crude oil without the imposition of supply restraints. A workable operating cushion must be allowed to exist. It is easily understood that if inventories are near tank bottoms, or at the operating minimum, any unexpected bobble will drastically affect prices. In order to avoid this price instability, the customer must feel a sense of confidence that the oil will be there when he needs it. The function of price management is essential, but it must be conducted as a separate activity from supply management and must be conducted within the framework of a smoothly functioning and reliable supply system. Returning to such a system is OPEC's challenge.

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How to Ensure Effective Competition in Western European Electricity Markets

*By Reinhard Haas and Hans Auer**

Introduction

Due to the electricity guideline of the European Commission in Western Europe, competition has started and prices dropped substantially, especially for large industrial customers. Hence, in Europe restructuring of the ESI is (currently still) widely accepted and considered to be successful so far. The major reason for this is the expectation that decreases in prices will continue and low prices will prevail over the next years.

Yet, surprisingly, up to now only few investigations exist on the conditions necessary for long-term competition in electricity markets. As has been argued by the authors – e.g., Haas et al (1997) and Haas/Auer (2000) – the expectation of lasting cheap electricity is based on very simplified assumptions on the strategic behaviour of electricity generators.

In this paper it is argued that many issues are currently neglected which may lead to tremendous backlashes for competition in Western Europe especially with respect to the level of electricity prices. The following questions are analysed:

- What are the basic principles for introducing competition and how are they currently achieved in Western Europe?
- How have the structures of the European electricity supply industry (ESI) changed in recent years and how have prices developped?
- What are the future perspectives for the ESI in Western Europe?

Due to the EU directive the liberalisation targets are:

19 February 1999	Users taking >40 GWh/yr, or 25% of national market
19 February 2001	Users taking >20 GWh/yr, or 28% of national market
19 February 2003	Users taking >9 GWh/yr, or 33% of national market
2007	Review of liberalisation process

Moreover, the EC announced recently that it intends to fully open the electricity market in 2005. Yet, this is subject to approval by the member country governments.

Figure1 depicts the opening of the market in different EU member countries in 2001. Some countries like UK, Sweden, Germany and Austria will then have fully opened their market (=100 %). Others like France, Greece, Ireland will only have opened the minimum. Norway (not in the EU) has already fully opened its market whereas in Switzerland (not in the EU) there still exist captured customers.

Basic Principles for Introducing Competition

The European debate on restructuring of the ESI is sometimes confusing. Especially the terms "deregulation", "liberalisation", and "competition" are very often mixed up. Another major contradiction and misleading perception is that deregulation means "privatisation".

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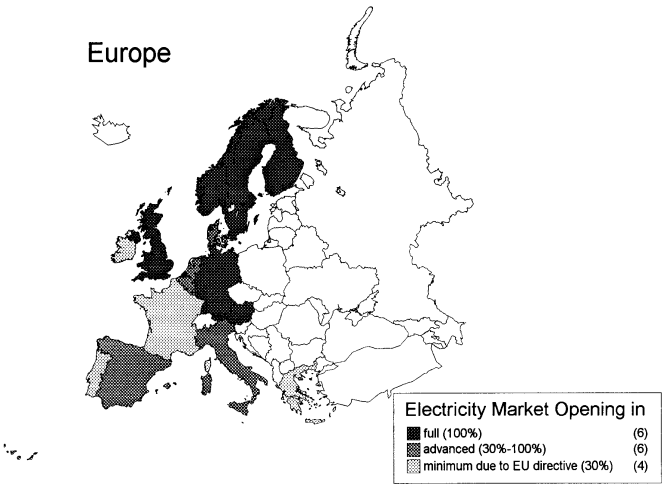
Figure 1
Market Opening in EU Countries (incl. Norway) in 2001



In the following the most important basic principles for introducing competition are summarised. It is important to note also that the following order in which the different elements have to be introduced is important!

- **Unbundling:** Competition requires the separation of parts of the ESI where competition is possible and parts where it is not. Currently, generation and supply competition is pursued while the transmission and distribution grids remain natural monopolies. The separation of electricity generators and the transmission grid is important because of two reasons:
  - to ensure that potential new generators are not discriminated from access to the transmission grid, and
  - to avoid cross-subsidization of generation by transmission.
- **Competition:** The basic principle of competition is that so many companies are competing that it is not possible for a single company to influence the market price and to exert market power. Hence, for real competition a large number of generators and suppliers is necessary to bring electricity prices down to marginal costs of generation. Moreover, excess capacities are required to make competition possible.
- **Liberalisation:** Liberalisation from the customers' point-of-view means that they may freely choose the supplier or the generator. Moreover, in a liberalised market the supplier may choose a generator or purchase electricity at a power exchange or spot market. Of course, from the customers'point-of-view it is very important that there is a large number of suppliers and generators.
- **Perfect markets structures:** In a functioning electricity market an equilibrium between different types of periodical markets exists – that is to say, between long-term contracts, short-term markets and balance markets. Of core relevance is that it is possible to sign long term contracts, e.g., bilateral or by futures. This possibility is a core difference between different liberalisation models. It did not exist in the "old" English pool model nor in the Californian electricity market. Yet, it does exist in the very well functioning NordPool.

If one of these market elements is completely neglected or even forbidden – as it was virtually in the case in California

with the long-term element – severe price volatilities and increases will be the result.

- **Deregulation:** The final step in the process is to abondan the regulation of electricity prices and investment recovery. Of course, this step only makes sense if real competition is guaranteed. Otherwise price deregulation may lead to a skyrocketing of electricity prices!
- **Privatisation:** Eventually the question remains whether privatisation contributes to more intensified competition. The answer to this question is "No" if the liberalised electricity markets in England and Norway are compared. In England privatisation was an important feature of the restructuring process.

  In Norway traditionally a large number of vertically integrated electric utilities existed. They were mainly publicly owned. The restructuring in Norway was based on the introduction of a voluntary pool, see Banks (1996). In Norway no privatisation took place. The situation in Norway with respect to the number of generators virtually did not change over the past 20 years. The public shares in these utilities has always been higher than 50% and it is not allowed to sell majority shares to investors from abroad. Yet, competition in the English pool did not really work for most of the time. The reason was that, although, there were several generators, only a small number owned price-setting "marginal plants". Green/Newbery (1992) found clear evidence of gaming in the UK power pool. The two largest generators made strategic use of their price bids for individual generating sets to obtain prices substantially above "real" marginal cost.

  The major conclusion of this comparison is: Privatisation does not mean "increased competition" but rather "strive for monopolies respectively oligopolies". Hence, full privatisation (100% private ownership) is not a condition for competition, which is proven impressingly by the Norwegian example.

The Western European Electricity Market

Currently, Western Europe is still far away from a joint electricity market. The Western European electricity market (15 EU member countries plus Norway and Switzerland) consists in practice of four to five markets which are rather separated. These are:

1) UK and Ireland, 2) The Nordic countries, 3) Spain and Portugal, 4) Italy, and 5) Central Europe (France, Germany ...).

These five markets are depicted in Figure 2. These markets are separated by geographical transmission capacity constraints and legal issues, mainly limited access to the grid (especially in France and Germany). With respect to Italy it has to be stated that the connection to other countries (mainly France and Switzerland) is mainly due to long-term contracts.

Figure 3 shows the physical exchange of electricity between these five markets in Europe in 2000.

The Development of the Number of Generators

As the current "merger-mania" shows – see Table 1 – the major strategy of investor-owned electricity generators in Europe is not to compete but rather to merge or to purchase shares. The mergers pursue two major objectives:

Figure 2
The Five Electricity Markets in the EU Countries

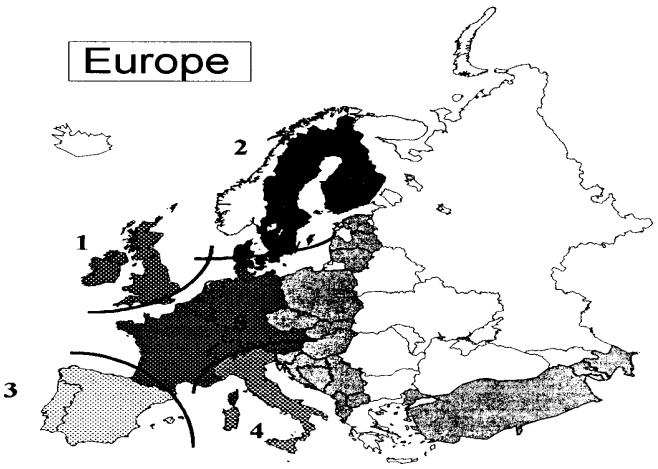
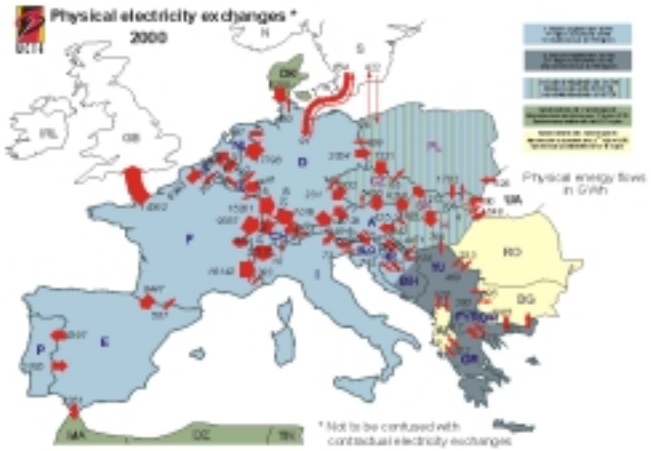


Figure 3
Physical exchange of electricity in Europe in 2000



1 An official one: to achieve a potential for savings due to synergies;
2 An unofficial one: to become able to set prices as high as possible. In practice minimal shares of owned by otherwise competing utilities respectively joint-ventures can avoid competition and to set strategic prices;

This leads to the following pattern which can be observed in most countries where liberalisation takes place: First, prices decrease but after a short period of time they start to increase considerably, see Figure 4.

Figure 5 clearly shows that the primary current goal of large European utilities is getting larger and heading towards oligopolies.

An important issue in this context is the resulting shutdown process of excess capacities. If excess capacity exists and utilities compete at least to some extent the price they receive for electricity will only be equal to the short-run marginal costs (SRMC). Under perfect competition without remarkable excess capacities the price will be equal to the long-run marginal costs (LRMC). But if there is no competition, either the price will be set strategically and might be substantially

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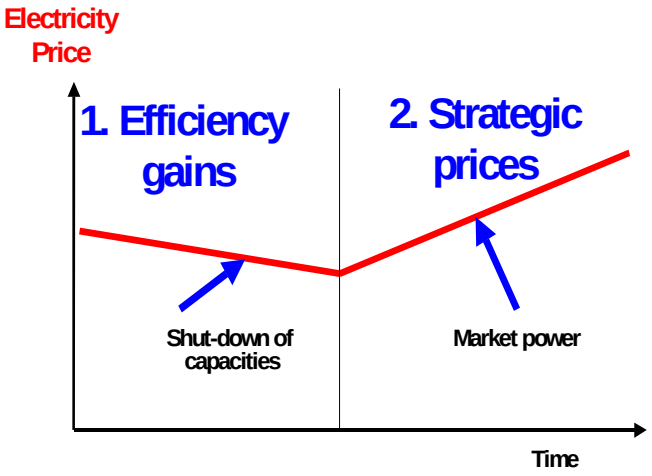
Figure 4
The ambigous role of shut-down excess capacities



higher than under competition, especially if demand is very inelastic. And the large German utilities E.ON and RWE have already announced that they intend to close substantial capacities.

Table 1
Major mergers, acquisitions and share purchases in Europe 1995- 2001

Acquiring Company	Acquired Company	Share
EdF	London Electricity (UK)	100%
EdF	SWEB generation, supply (via London Electricity)	100%
EdF	ESTAG (A)	25%+1vote
EdF	EnBW (D)	25%+1vote
Vattenfall (S) (via Vasa Energy)	Stadtwerke Rostock (D)	12,55%
Vattenfall (S)	HEW (D)	25%
Texas Utilities (US)	Eastern (UK)	100%
ScottishPower (UK)	Manweb (UK)	100%
ScottishPower/PacifiCorp (UK)	ScottishPower, PacifiCorp (UK)	merger
National Power (UK)	Midlands Electricity (UK)	100%
PowerGen (UK)	East Midlands Electricity	100%
Preussen Elektra (DE)	EZH (NL)	25%
Scottish Hydro Electric	Southern Electric	100%
PNEM-MEGA	PNEM/MEGA Limburg	merger
EnBW (D)	EVS/Badenwerk	merger
BirkaEnergi (SE)	Stockholm Energi/Gullspang	merger
Electrabel (BE)	EPON (NL)	40%
E-ON (D)	Preussen Elektra/Bayernwerk (D)	merger
RWE (D)	VEW (D)	100%
Vattenfall(S) /HEW(D)	VEAG (D)	51%
E-ON (D)	PowerGen (UK)	100 %
E-ON (D)	Sydkraft (S)	51 %
RWE (D)	KELAG (A)	22 %
E-ON-Hydro (D)	Austrian Hydro Power (A)	merger

Figure 6 depicts the development of electricity generation prices in major European markets. It can be seen that there are considerable differences between different markets. The UK pool price is three times higher that the cheapest market, the NordPool. Yet, in recent months the prices in the NordPool have caught up, mainly due to looming capacity shortages. Also the Spanish pool price is higher than the average. The electricity price at the new German bourses EEX (Frankfurt) and LPX (Leipzig) is lower that the Spanish and English pool price. But it has caught up considerably over the last two years.

Market Imperfections Due to a Lack of Regorous Unbunding

Currently due to a lack of rigorous unbundling market power of generators over the grid is a major obstacle for a real competitive electricity market. Especially in Germany and France

Figure 5
Ranking of the largest European electricity generators in 1999 and 2001. Source: annual reports.

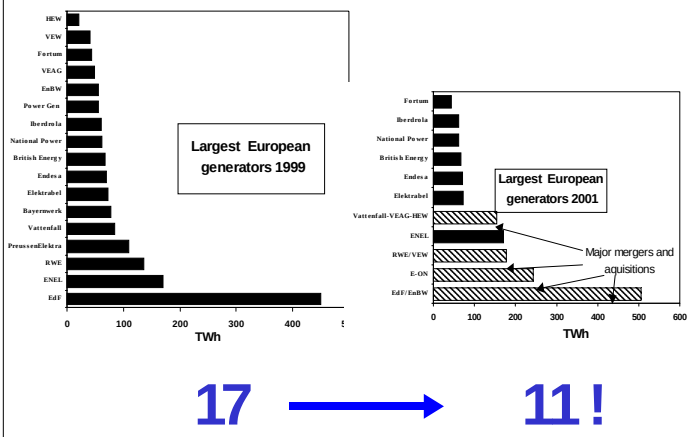
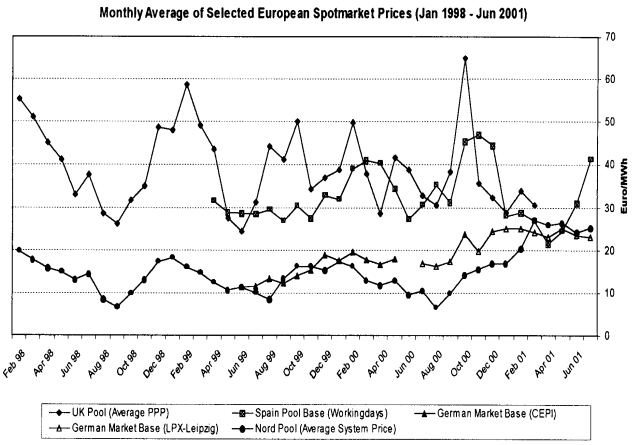


Figure 6
Development of Electricity Generation Prices in Major European Markets



it is likely that incumbent generators will retain market power over the transmission grid over the next years. The major problem in Germany is that due to private ownership of the large vertically (generation + transmission) integrated utilities it is virtually impossible to achieve a rigorous unbundling. On contrary, the majority of EU countries have implemented at least fully legal unbundling. Moreover, in Scandinavia, UK and Spain there exist separate grid companies, see Table 2 and Figure 7.

Competition in various EU member countries is further curtailed by high transmission fees and differences in transmission pricing models. Figure 8 compares the share of transmission and distribution costs in selected Western European countries in 2000 for residential customers. As can be seen they vary tremendously. On the one hand, they are still high in recently liberalised markets like Austria and Germany. According to the announcements of the regulatory bodies in these countries they are expected to decrease in the future. On the other hand, in Norway the transmission and distribution charges are extremely low. As a consequence, currently less investment to maintain the grid is taking place. In order to change this situation in the future, charges for transmission and distribution have increase.

Table 2
Type of unbundling and access to the grid in several EU member countries incl. Norway in 2001 (rTPA...regulated third party access, nTPA...negotiated third party access, SB...Single Buyer model).

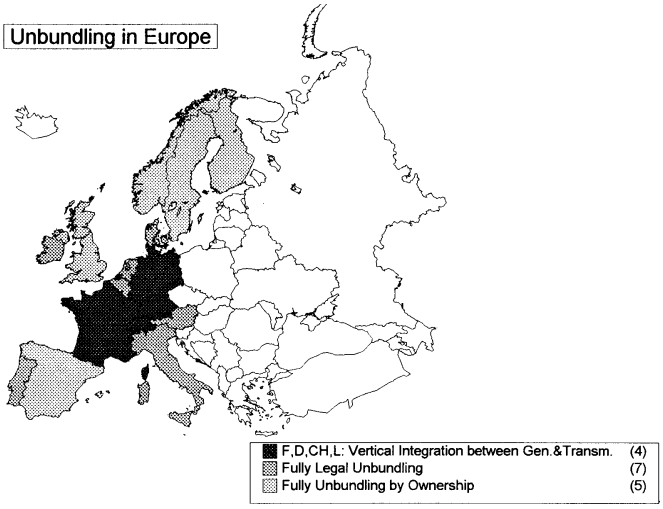
Electricity Mkt. EU Country	Unbundling 2001	Access to GRid 2001
Austria	Legal (AGP); Mgmt. (TIWAG,VKW)	rTPA
Belgium	Legal[1]	rTPA
Denmark	Legal	rTPA
Finland	Ownership	rTPA
France	Management	rTPA
Germany	Management	nTPA
Greece	na	rTPA
Ireland	Legal	rTPA
Italy	Legal	rTPA...elgible customers SB(rTPA)...captive customers
Luxembourg	Management	rTPA
Netherlands	Legal[2]	rTPA
Norway	Ownership	rTPA
Portugal	Legal	rTPA...elgible customers SB(rTPA)...captive customers
Spain	Ownership	rTPA
Sweden	Ownership	rTPA
UK	Ownership (E&W):Mgmt. (Scotland, Northern Ireland	rTPA

1 Belgium: although the TSO has not been nominated yet.
2 The Dutch state intends to buy the majority in the Dutch TSO, which will then be unbundled in ownership terms.

Development of Prices for Final Customers

Of special interest, of course, is how prices differ between countries and how prices changed over different periods in the past.

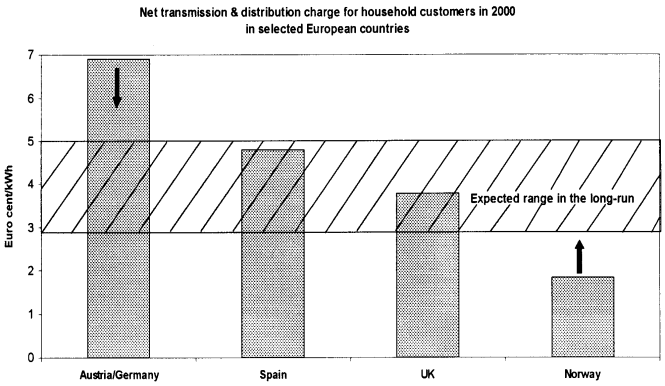
Figure 7
Degree of unbundling of the transmission grid in Western Europe 2001



We first look at current price structures in EU countries as depicted in Figure 9a and 9b. As can be seen prices for households as well as for industry still vary tremendously between different EU countries. In January 2000 in Western Europe electricity prices differ in the residential sector between 0.06 •/kWh (Finland) and 0.15 •/kWh (Italy) and in the industrial sector between 0.038 •/kWh (Nordic) and 0.075 •/kWh (Austria). Hence, the cheapest electricity prices, for industrial customers as well as for households, in the countries investigated, are provided in Scandinavia (Sweden, and Finland.)

In Figure 10 the changes in the electricity prices for households and industry are described.

Figure 8
Share of transmission and distribution costs in selected Western European countries 2000



In Figure 10a and 10b the changes in current prices from 1991 to 2000 is shown for selected European countries. Of course, prices for industry and household are quite different.

Figure 9

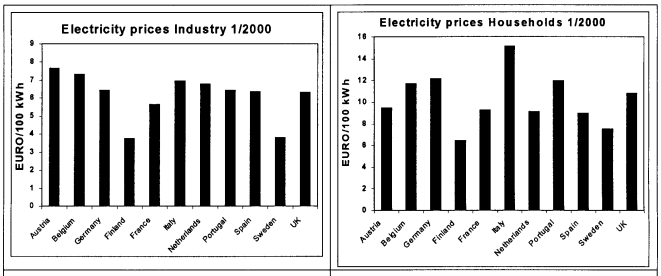


Figure 9a. Comparison of electricity prices of medium industrial customers in 2000 (excluding taxes Source: EUROSTAT)

Figure 9b. Comparison of electricity prices of medium household customers (as of January 2000, excluding taxes, Source: EUROSTAT)

While electricity price development in the household sector is

Figure 10

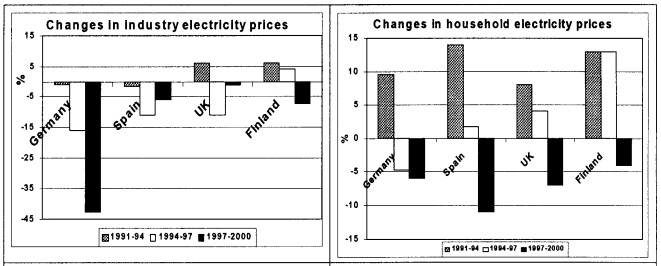


Figure 10a. Changes of industrial electricity prices (in %) from 1991-2000 in current prices in selected countries. Source: IEA-, EUROSTAT

Figure 10b. Changes in residential electricity prices (in %) from 1991-2000 in current prices in selected countries. Source: IEA-Statistics, EUROSTAT

rather inhomogeneous among the different countries, industry prices decreased over the last decade in all countries.

Worth mentioning is the German situation: the price reductions are not only due to the restructuring of the ESI. If we look at German electricity price developments from 1994-1997 instead of 1991-1994 in the industrial sector a decrease of 10% can be observed. Since in Germany in 1996 the so-called "Kohlepfennig" - a tax on customers bills - was cancelled (which

(continued on next page)

had to be paid by all customers) resulting in substantial electricity price reductions of up to 24% for industrial customers.

The above analyses provide evidence, that in Western Europe short-term electricity prices dropped substantially due to liberalisation and competition (but not for all customer groups to the same extent).

Future Perspectives

Most of the arguments raised above indicate that electricity prices in Europe will start to increase soon. There are some further aspects which support this argument:

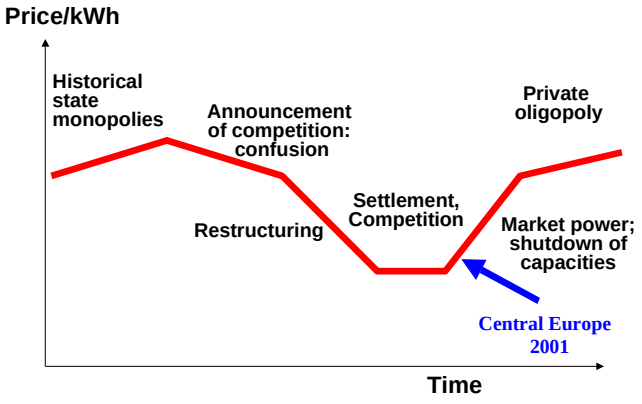
- Increasing dependence on natural gas and increasing natural gas prices
- Increasing horizontal integration
- Volatile production from hydropower
- Increasing reliance on imports
- no incentives for building new capacities

Summarising all arguments, it is likely that the development of electricity prices over time in liberalised markets will follow the pattern shown in Figure. 11.

Figure. 12 depicts the recent developments on the wholesale level in Germany from 1999 - 2001. It can be seen that since 1999 wholesale prices have been increasing steadily.

Another interesting case in point is the dynamics of

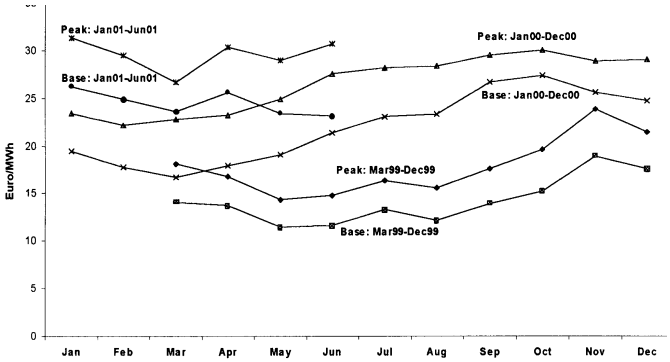
Figure 11
Evolution of electricity prices over time (in principle) in liberalised electricity markets.



various developments. Previously the fundamental conditions for competition in electricity markets have been summarised. With respect to these different conditions, currently the basic strategy of incumbent utilities in Western Europe appears to be as follows: There are two phases:

- In phase 1 competition would be possible because of excess capacities and a sufficient number of generators existing. But it is curtailed by barriers for access to the grid, barriers for changing suppliers and limited market opening in some countries. Hence, barriers are maintained to postpone real competition until there is no relevant number of competing suppliers available.
- In phase 2 when finally the most pressing problems regarding access to the grid and customer switchover are settled (e.g., due to the so-called "Florence-Process") competition will no longer be possible because of a lack of generators and excess capacities as well as competing suppliers.

Figure 12
Recent development of wholesale electricity prices in Germany 1999-2001
Monthly Average Spot market Prices (day-ahead) in Germany from March 1999-June 2001



Conclusions

Policy makers and the public in Western Europe are currently still blinded by the recent drops in electricity prices. Yet, how long will the currently expected increases in competition and the observed decreases in prices continue?

The major conclusions of this analysis are:

- A major condition for competition are many generators. Yet, in Western Europe currently the number of generators decreases continuously mainly because of strategic alliances and mergers.
- Cheap electricity prices can be sustained only if excess capacities are available. We predict that after the dust of merging, acquisitioning and share purchasing has settled, sooner than many expect, capacities will become scarce in Western Europe. Thereafter, prices will become more volatile and increase substantially;
- Competition requires a rigourous separation of market elements where competition is possible (generation and supply) and parts which remain natural monopolies (transmission grid). Unbundling of generation and transmission by means of separate accounting as currently practiced in various countries is not sufficient for real competition!
- Full privatisation of utilities is not relevant for introducing competition;
- Yet, the developments described above also provides new opportunities, especially for more efficient use of electricity and for decentral generators. The gap between decreasing large "old" capacities and increasing demand has to be met by increases in energy efficiency and new decentralised generation facilities. These will be based most favourable on renewable energy sources. High electricity prices will. of course, support these developments.

Finally, we note that liberalisation is not the target but a means. Or as John Chesshire put it "Liberalisation is a means, not an end!".

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(continued on page 30)

Scenes from the Houston Meeting

President Arild Nystad and Past President Peter Davies with Journalism Award Winner Barbara Shook.

Arild Nystad presents Michelle Foss with a remembrance of her general chairing of the meeting.

Arild Nystad presents Peter Davies with his Past President's Award.

Shirley Neff addresses the meeting.

Past President Campbell Watkins, Herman Franssen and Paul Stevens enjoy the reception.

A group of "ruffians" attempts to disrupt the meeting.

FERC Buckles Under Pressure, Unveils New Price Mitigation Plan

*By Fereidoon P. Sioshansi**

California's Golden Dream Turns into a Nightmare

The original plan was to let the market forces – not regulations – set electricity prices. To create a competitive wholesale market, California policymakers encouraged incumbent utilities to divest most of their generation. Moreover, they gave the new independent generators near-total freedom on how much they could charge for their energy (in the daily PX auction) and capacity (in the real-time ancillary services market). The critical assumption was that intense competition among rival generators would force prices down and keep them low. This would obviate the need for price regulations.

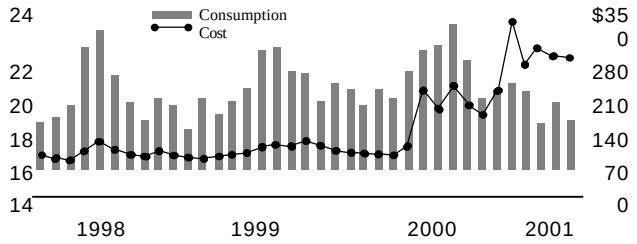
This utopian dream of a self-regulating wholesale market blurred the policymakers' vision and became the fundamental assumption that drove everything else. For example, with low wholesale prices – the argument went – retail rates could be capped. Why bother with long-term, fixed-price contracts – a form of risk insurance – when prices would be stable and low? Similarly, why bother with expensive integral load meters and real-time prices when prices are low around the clock?

Not as Envisioned, Not as Promised

That dream, embodied in the landmark Assembly Bill 1890, passed in 1996, of course, has turned into a nightmare. Prices at the wholesale market began to shoot out of range starting in 2000 (see accompanying graph). In a capacity-constrained market, independent generators gradually learned to drive up prices without braking any laws or engaging in overt price fixing.

California's monthly electricity consumption and average energy price, 1998-2001*

Million MWhs (left scale) and $/MWh (right scale)



Source: Caliornia ISO

* The CA market opened in April, hence there are data for 9 months in 98

While wholesale prices started hovering at levels significantly above 98-99 prices, regulations kept retail rates capped. Since wholesale prices could not be passed on to consumers, there was no effective mechanism for demand to respond to high prices. Consumers continued to use electricity at artificially low prices – significantly lower than what utilities were paying.

Utilities were caught in an awkward and unsustainable predicament. For several months in 2000, they had to buy wholesale power at exorbitantly high prices, selling it at significantly lower levels to their retail customers. Their mounting accumulated debt has sent one, Pacific Gas & Electric Company (PG&E), to seek protection in the bankruptcy courts. The other, Southern California Edison Company (SCE), is in dire financial straits. The state has had to step in to buy power on behalf of the beleaguered utilities since January 2001. The PX market has folded. Retail competition is no more.

The consequences are, of course, dire for the utilities, for the consumers, the California economy, and may ruin the political career of California Governor Gray Davis. His approval rating, for example, has dropped 23 points to 46% since January. The poll was taken before the recent big rate increases approved by the California Public Utilities Commission (CPUC), and before any blackouts. (In May, the CPUC reluctantly approved the largest rate increases in California history, averaging 37-50% for commercial and industrial customers, lesser amounts for residential customers. This on top of an average rate increase of 9%, approved in January). It could get worse with the approach of hot summer months, and expected blackouts.

Moreover, some of the Governor's critics are now saying that the state should not have signed so many long-term power-purchase contracts just at the peak of the crisis. It is not a good idea to go shopping for hurricane insurance just as the hurricane is taking the roof off of one's house. Reportedly, some 38 such contracts with liabilities exceeding $43 billion have been signed, all in great haste and in total secrecy – at the height of the crisis.

What Do We Do Now?

That's all history. The urgent questions now facing California's Governor, state lawmakers, the CPUC, and the hard-pressed grid operator are:

- how to make it through the summer months with demand expected to exceed available capacity for many hours; and
- how to manage the soaring costs of buying power from the independent generators who stand to gain from continued supply shortages.

The former is primarily driven by summer temperatures. If it turns out to be a mild summer, and if the hot temperatures come later in the fall, then California may just make it with few or no rolling blackouts. Several thousand MW of generation are expected to come on line between July tandSeptember. Belatedly, energy conservation and demand responsiveness are also being pushed as far as they can go.

The latter has been the subject of much debate at both the state and national level. Many, including a number of prominent economists who have studied the California market, have reached the obvious conclusion that this is no ordinary market. The very real capacity (and transmission) shortages and the imminent possibility of rolling blackouts gives independent generators an enviable bargaining position. They can literally ask any price they want, and get away with it. That's precisely what they have been doing. Even though none has a dominant market share, each can individually affect prices since there is so little spare capacity in the system.

Given the overwhelming evidence of *price gouging* – the non-technical term for saying that the generators are able to

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collect prices significantly above their generation costs – the debate has focused on what to do to control prices until the market can become competitive again.

With thousands of MW of new capacity under construction or in advanced stages of planning and licensing, normalcy is expected to return to the wholesale power market. In fact, there are predictions of a supply glut in a few years' time. Once there is some excess capacity in the system, competition will force down prices, as California lawmakers had originally envisioned. But what can be done while we await for that wonderful outcome?

FERC: From Cost-based To Market-based

One of the enduring relics of the Roosevelt Administration era is the 1935 Federal Power Act. Its main tenant is that wholesale electricity prices, which are under the jurisdiction of the Federal Energy Regulatory Commission (FERC), should be cost-based. The federal law also requires that prices charged be *just and reasonable*, what ever that means.

Electrifying Milestones
Major Laws with Significant Impact on U.S. Electricity Market

Date	Law	Major intent/impact
1935	Federal Power Act	Created today's FERC and established principles for regulating wholesale electricity pricing
1978	Public Utility Regulatory Policy Act (PURPA)	Allowed independent power producers (IPPs) to flourish and created the QF industry in states such as California
1992	Energy Policy Act (EPAct)	Introduces the premise of a non-discriminatory open access transmission network
1996	FERC Orders 888 and 889	Spelled out FERC's long-standing policy on how an open access transmission system would work in practice; Order 889 spelled out the details of the Open Access Same time Information System (OASIS)
1999	FERC Order 2000	Encourages the establishment of Regional Transmission Organizations or RTOs

A lot has changed in electricity markets since 1935 (see table). The generation market has been opened to competition starting in 1978 with the passage of the Public Utility Regulatory Policy Act (PURPA) which created today's independent generators. Subsequently, the passage of the Energy Policy Act (EPAct) in 1992, and FERC Orders 888 and 889 in 1996, opened the country's high voltage transmission network to third party users, at least in theory. FERC's more recent Order 2000, released in December 1999, encourages the creation of Regional Transmission Organizations or RTO.

Over the years, these laws have led to the emergence of IPPs, power marketers, and traders. Companies like Enron, Dynegy, Williams, Mirant, and Calpine that that did not exist two decades ago, are now major players in the new electricity market. In the process, FERC has assumed a more prominent role in defining, actively promoting – and paradoxically – regulating the nature and level of competition. The agency, for example, must approve the rates and the underlying methodology of power marketers, who are now major players in the U.S. electric power sector.

Since the early 1990s, and with the emergence of competition in wholesale and transmission markets, FERC has gradually shifted from its historical focus on cost-based pricing to what may be called market-based pricing. For example, in the 1990s, FERC has approved applications of 962 power marketers based on this principle. In doing so, it has increasingly taken a laissez faire attitude. If an applicant claims that the market in which it intends to operate is sufficiently open and competitive, FERC is likely to give the benefit of the doubt. Since applications are to be renewed every three years, the agency figures it can catch the mischievous players sooner or later.

These liberal policies generally worked until the California fiasco. With tight supplies and the incredibly lax market rules in effect, private generators and power marketers began to charge prices that are significantly higher than historical cost levels. With bloated operating incomes and high profits, generators and power traders have a hard time denying the fact that they are making super-normal profits. Nor can they deny that these profits are possible due to the tight supplies and the absence of any effective market rules that would restrict what prices may be charged.

These super-normal profits have become a contentious political issue, to put it mildly. With the state of California currently picking up the tab, it infuriates Governor Davis to no end. It is estimated that some $50 billion (based on extrapolating the prices for the first 5 months for all of 2001) may flow from the pockets of California customers and taxpayers to the pockets of a handful of generators and power marketers.

During his meeting with President Bush in May, Governor Davis made a big fuss about this unfair wealth transfer. He has said, time and again, that FERC should fulfill it statutory responsibility, which is to ensure that prices charged are cost-based, just and reasonable. His fellow Democrats in the U.S. Senate held hearings in June, examining FERC's apparent lack of resolve in enforcing the law.

Convincing FERC to Change Course Not Easy

With wholesale prices hovering significantly above normal, what ever normal is in these abnormal times, California has been bleeding at an unsustainable rate. Governor Davis, who had trouble identifying the real villain, has finally found it. And it is none other than the Federal Energy Regulatory Commission (FERC), the agency charged with the task of making sure wholesale prices are cost-based, just, and reasonable.

True, private generators and marketers are pocketing huge sums of money. But they are not the real culprits. These companies are merely profiting from a tight market and lax market rules, as any profit maximizing firm would. It is FERC's duty to police them, and FERC has not been doing its job. Now comes the hard part: forcing FERC to be more diligent in enforcing the law.

In May, California's independent system operator (ISO) filed a petition with FERC requesting that two key players, AES Corp of Arlington, VA and Williams Co of Tulsa, OK be barred from selling power in California at what ever prices the market will bear. Instead, the ISO wants the two companies to be forced

(continued on page 24)

FERC Buckles Under Pressure *(continued from page 23)*

to sell their output at prices that are tied to the actual cost of production.

In June, the ISO filed a second petition, requesting that FERC revoke the ability of four other mischievous generators from naming the price of the power they sell in California market. The four identified were Reliant Energy Inc., and Dynegy Inc., both Houston, TX based companies, Mirant Corp. (a subsidiary of Southern Company based in Atlanta, GA), and Duke Energy Corp., based in Charlotte, NC. ISO has asked FERC to revoke their licenses to sell power at market-based rates, pointing out that there is no competitive market in California to speak of.

On the surface, this sounds like a convincing argument. But this goes to the heart of a long-standing FERC policy which has gradually shifted from cost-based to market-based. More importantly, it challenges FERC to accept the prevailing view that it should make an exception, at least in the current case of the non-functioning California market. Since California is interconnected to 10 neighboring states, FERC must in effect control prices in all Western states if it is to help California's dysfunctional electricity market. And since there is no effective market in any of these states, this is not as easy as it may sound. The motion, however, has an ardent supporter within FERC, Mr. William Masey, an Arkansas Democrat.

Under increasing pressure, FERC was hard pressed to ignore California's plight. The methodology it has used up to now to determine the presence of market power is outdated and fundamentally flawed. In describing the method to *The Wall Street Journal*, (1 June 01) Mr. Massey said, "*The method we use has a single virtue. It's quick to administer and everyone passes. But it isn't an effective screen in today's market*."

Under Pressure, FERC Changes Course

In view of overwhelming evidence – and political pressure – FERC had to act. And it finally did. In late May, the agency launched a price mitigation plan – avoiding the politically incorrect word price cap. On 18 June, FERC went a significant step further, extending the order to cover the entire Western part of the United States, extending the price mitigation plan to all hours, and closing many remaining loopholes. Governor Davis, sensing that he has finally gained the upper hand, said, "there is much more they (FERC) should do." President Bush and Vice President Cheney, who had both insisted that the markets, given sufficient time, will take care of the problem, had to pretend this was their idea all along.

FERC's initial proposal was to impose a soft and variable benchmark price calculated based on estimated production costs during periods where suppliers are tight. Tight supply was originally defined to include all periods when demand is within 7% of the available reserves. The 18 June decision has extended this to include all hours. All transactions above this benchmark price are treated as *suspect*, and may be subject to review and possible refunds. Moreover, the 18 June decision now covers 11 Western states, an area with a population of 65 million, covering roughly half of the country to the West of Kansas.

FERC's New Game Plan

Main features of FERC's new price mitigation plan:

- Calculate a variable *price benchmark* covering all hours based on estimated production costs;
- Review transactions above benchmark price as suspect; subject to refunds and possible fines;
- Require all generators to offer *all available capacity* into the market;
- Collect and analyze weekly bid data and plant outages; and
- Initiate investigation of *electricity trading practices* throughout the interconnected Western states.

Source: FERC's price mitigation plan, June 2001

A second significant requirement imposed on generators is that they *must* henceforth offer *all* available capacity to the ISO. Previously, there was no such requirement. Generators could offer as little or as much of what they had in the market. According to critics, thus far, it has been easy to manipulate prices by withholding some capacity from the market, further exaggerating the scarcities and artificially jacking up the prices.

This new requirement, however, will be tough to enforce. Short of sending an army of inspectors to each generating plant to make sure that all units are properly maintained and all available units are offered in the market, FERC must rely on generators' words. To monitor and ensure compliance, FERC now requires weekly reports from state officials on bid prices and information on plant outages. To put power traders on guard, FERC has said that it will *initiate investigations into electricity trading* practices across the interconnected Western states.

How's this different than FERC's earlier and largely unsuccessful *soft price cap* of $150/MWh? The previous soft cap only applied to prices during Stage 3 Alerts, when demand is within 1.5% of available capacity. The new initiative applies to all hours. More importantly, the new price mitigation plan calculates a *variable* benchmark price – not a pre-determined soft cap.

In the end, however, this is nothing more than a temporary fix for a wobbly market. The real solution to California's market malaise is to bring back a healthy excess reserve and to create demand elasticity. The former will be solved once more capacity comes on line; the latter once a significant portion of customers are exposed to variable wholesale prices. Until these two conditions are met, FERC must engage in a frustrating and largely futile game of cops and robbers with the generators.

Has Energy Economics A Viable Future?

*By Paul Tempest**

Many of us in the IAEE today have arrived at a career in energy economics from unlikely origins and often by diverse, if not bizarre, routes. Energy economics is a crossing of many ways : the strength and reputation of the profession lies not only in the grasp and understanding of the detail but in the broader overview of global economic and energy fundamentals and an awareness of the driving forces of technological change and international co-operation and inter-dependence.

In my own case, I began my education with a rigorous training in logic and language at Oxford. So, whenever I attend a conference like this (and I have attended 21 of the 24 annual international conferences of the IAEE so far), I always carry a small notebook to jot down any new arguments and also to record changes in the language of energy economics.

Out of a long list this year, I liked particularly, the ominous ring of a CLM (a career limiting move) and the grim prospect of a 24-7-52 working year; also the T-shirts marked STOP PLATE TECHTONICS; and wondered whether the PLATED BREAKFAST served yesterday would be gold-, silver-, steel- or tin-plated or a counterpart to NO FREE LUNCH.

On a more serious linguistic note, I was prompted by Shirley Neff's masterly review of the brand-new US presidential energy agenda to wonder how long those pretentious and outworn concepts,

SUSTAINABLE DEVELOPMENT

ENVIRONMENTAL CONSERVATION

OPEN MARKET REGULATION

might last in the fresh, breezy new Texan linguistic style in the White House. Each, an oxymoron, has probably already exceeded its shelf-life. How soon, I wonder, will we have to wait in California for

SUSTAINABLE STANDSTILL ?

ADAPTING TO THE ENVIRONMENT ?

CONSENSUS PRICE-CAPPING ?

Going back to our first IAEE International, held in Washington in 1979, we spoke an almost completely different language – that dominated by Cold War politics and OPEC confrontation where the key issues were seen to be possible European dependence on Russian gas blocked by US embargo, Limits to Growth caused by fossil resource depletion, Project Independence whereby the United States would quickly eliminate oil imports and the imminence of War in the Middle East, caused by political chaos in Iran. Parts of these issues have passed inexorably into history; other parts have a familiar ring about them.

In this year's IAEE Conference, we have focussed on US and particularly Californian gas and electricity supply shortfalls, the shortcomings of the privatisation and deregulation process, Middle East capacity constraints and the painfully slow impact of new vehicle technology.

You were fairly evenly divided in the poll in Marianne Kah's session on whether Government should or should not intervene in energy pricing. Yet you were almost unanimous in the conviction that governments would continue to intervene. Equally, in this final session, you were unanimous in expecting OPEC or the OPEC lead-producers to continue to intervene to move the oil-price, but fairly evenly divided as to whether this would be good or damaging for the world economy and global markets.

As we bring this splendid conference to a close, I will leave you with two thoughts drawn from our debates.

The first concerns the current acceleration in new energy and communications technology and the inability of the financial and stock markets to see much beyond the year-end. Dr Samuel Johnson put it well, in referring to a brewery in mid-18th century England :

> "We are not here to sell a parcel of boilers or vats, but the potentiality of growing rich beyond the dreams of avarice".

Of course we are going to resolve with some pain almost all the minor energy supply constraints preoccupying us at present. Brand-new, clean technologies of energy are already clearly within sight, although most here today seem to be thinking more in terms of a 50-year transition period than one of 20 or 30 years. Meanwhile there appears to be an adequate global resource base of oil, natural gas and coal, abundant development finance and a benign investment climate.

We will, however, only get there if we can apply common sense and an orderly evaluation of risk and opportunity. The mobilisation of human energy is, as always, the key to the future. With the internet and the globalisation of markets, we are currently taking a quantum leap forward in the deployment of human energy.

Energy economics is an essential tool in this process. The energy economist, not the corporate accountant or refinery engineer, is best placed to demonstrate the foolishness of, say, devoting 10-20% of a refining budget to improving only marginally the quality of tailpipe emissions as specified in many different ways by many different authorities in many different places. The lunatic fringe of the current energy debate can only be discredited in its entrenched positions by common sense and informed analysis of the data available.

The key long-term issues facing the energy industries today have less to do with geology, engineering and salesmanship and a great deal to do with public and government acceptability and a keen understanding of commercial, financial and geo-political risk. These are all areas where sound energy economists will have a vital role. It is, therefore, a pretty safe conclusion that, however rough the ride on the roller-coaster to come, the profession of energy economics will be providing challenging and satisfying employment for many - for many generations to come.

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Innovations and External Growth Strategy: The Case of Oil and Gas Supply and Service Companies

*By Sébastien Barreau**

This work is concerned with the wave of consolidations that the upstream oil and gas service and supply industry has been going through since 1990. Scores of companies in this sector have relied on an external growth policy designed to reinforce their core business, to broaden their range of services, and to fully revamp their operations. The oil and gas service and supply sector today is distinguished by the existence of an oligopoly formed of three majors (Baker Hughes, Halliburton and Schlumberger) and numerous smaller oil and gas service businesses that we will call the "competitive fringe". The evolution of this industrial sector is characterized by the fact that every company that implements an innovation is imitated by one or more competitors. To show this phenomenon in the sector we study, we rely on Schumpeter's work (1942).

The Work of Schumpeter on the Evolution of an Industrial Sector: A Short Synopsis

According to Schumpeter, companies implement strategies via different levers: by influencing the number of companies, by differentiating between products and/or factors of production, by erecting barriers and by controlling the flow of information.

The author lumps these strategies under a single name: innovation, and the development process of capitalism is driven by five types of innovation:[1] the production of a new product, (of better quality or designed to respond to new demand), the introduction of a new production or marketing method, the opening of a new market, the use of a new raw or intermediate material and the establishment of a new organization.

The Schumpeterian cycle hence begins with the establishment of an innovation by an entrepreneur and the search for monopoly power (new product, new process, new market, new source of raw material or new form of organization). This innovation enables the firm to increase its profits. Then competing (or potentially competing) companies imitate the innovation. Hence it is at this stage that the followers appear. The innovation thus becomes ordinary, with the result of lower profits for the competing companies.

This illustrates a strategic pattern of the "leader – follower(s)" type. Then the same company, or a competing firm, assumes the leadership role to innovate and within a variable period of time, it is imitated by competitors.

Innovations and "Leader – Follower" Pattern in the Oligopoly (Baker Hughes, Halliburton and Schlumberger)

We identified four major innovations that have occurred recently in the oil and gas supply and service sector. These innovations were initially launched by one of the three leading firms and were quickly imitated by the other two.

The first of these innovations is organizational. It occurred in the late 1980s, a few years after the 1986 oil aftershock, and consisted of the firms' redefinition of their activity portfolios. This development resulted from a sector crisis that accompanied a slump in crude oil prices which led the oil companies to drastically cut their exploration-production budgets, the main source of income of the supply and service companies. Faced with a declining market, the supply and service companies were forced to draw up restructuring plans driven by the more efficient utilization of their production capability.

The company that emerged as the leader in this innovation is Halliburton, which refocused on some of its activities from 1986 to 1989, and consolidated by absorbing other trades. Reinforced activities included drilling fluids with the creation of a joint venture in 1986, M-I Drilling Fluids, with a division of Dresser, and seismic business (acquisitions of Gearhart Industries and 60% of GSI in 1988, and Sierra Geophysics in 1989). This strategy was speedily imitated by Baker Hughes in 1987 and until 1994. Baker Hughes wanted to preserve operations offering attractive margins, as well as those in which the group was number one or two worldwide and for it, reinforced its submersible pumps activity (acquisition of Edeco in 1989), instrumentation (acquisitions of Vetco Gray in 1987, Bird Machine in 1989, Tracor and Elder Oil Tools in 1990) and chemicals (acquisitions of Chemlink and Ceda Reactor in 1990). The same development pattern was witnessed at Schlumberger between 1988 and 1993, which reinforced its information systems[2], seismic and 3D software[3], wireline logging and measurements during drilling activities, as well as cementing. The group also sold its defense and graphic operations in 1988.

Thus for this innovation, which consisted in setting up a new organization (by altering the operational frontiers of the firms), we have a "leader – follower" pattern, or more precisely a "one leader – two followers" pattern, which recurred in the three developments described below.

The second innovation occurred between 1992 and 1996 and, for the three firms examined, consisted in broadening the range of services supplied in order to propose an integrated service. This innovation was driven by the demand of the oil companies, which decided to subcontract more operations to the supply and service companies. This innovation has offered the supply and service companies a new market and encouraging the implementation of new working methods, materialized by the search for alliances and partnerships.

The company that played the leader role among these three firms is Baker Hughes, which created the Baker Hughes Inteq division, which led to the supply of integrated services and the search for partnerships with oil and gas clients. The competition promptly responded. In 1994, Halliburton created the Halliburton Energy Services division, which combined all the energy operations of the group. This customer oriented strategy was accompanied by an internal restructuring that caused the group to sell off its geophysics operations and create Halliburton Drilling Systems, including the directional drilling operations. The implementation of this strategy was initially less pronounced at Schlumberger, although in 1994, the group organized itself into 11 world scale product lines, with closer attention paid to customers, the aim of the strategy being to shorten the product development cycle.

The third innovation that we consider corresponds to major mergers and acquisitions which occurred in 1998 (Table 1). Halliburton first set the example by acquiring

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[1] See footnotes at end of text.

Dresser in February 1998 in order to propose completely integrated services, quickly followed by Baker Hughes in May which bought Western Atlas, world leader in geophysics.

Table 1: Mega-Mergers in the Oil and Gas Supply and Services Industry in 1998

Buyers	Targets	Amount
Baker Hughes	Western Atlas	5.5 G$
Halliburton	Dresser	9.0 G$
Schlumberger	Camco	3.1 G$

As to Schlumberger, the acquisition of the US Camco offered it a niche in which the group was not yet positioned, the drilling tools sector. Following this operation, Schlumberger covered all the trades in geophysics and drilling (and borehole associated services).

This race to bigness has sparked a wave of asset sales and refocusing : Schlumberger sold its offshore drilling operations in 1999. Baker Hughes, in 2000, sold the seismic assets it acquired in 1998. This sale led to the creation of a joint venture (Western Geco, 30% owned by Baker Hughes and 70% by Schlumberger). Similarly, Halliburton sold Dresser Equipment Group in 2000 as part of a refocusing on its core business.

Developments in e-business and the advent of the new economy appears to be the fourth innovation witnessed by the oil and gas supply and service sector. However, it is still difficult to have an overall grasp of the situation since it is still in the early stages. We can simply highlight that Schlumberger played the leader role in setting up this new marketing method, with the creation of "indigopool.com" in January 2000. Emulating Schlumberger, Halliburton acquired 15% of Petroleum Place in August 2000, a specialist on the Internet in the market for asset acquisitions and divestitures in the oil and gas industry.

These four mutations were chiefly achieved by relying on an external growth strategy that enabled them speedily to acquire the expertise held by others.

Repercussions on the Overall Oil and Gas Supply and Service Industry

We have adopted the following assumption for the competitive fringe: the company growth mode reflects a "3 leaders – many followers" logic, according to which the three oligopolistic firms are now the leaders and all the smaller companies are the followers. Now we test this hypothesis and determine to what extent such a development pattern has been pursued by the competitive fringe.

Increased size has undeniably been a strategic objective largely adopted by the drilling and geophysics companies since 1990. 83% of the firms have increased their production capacity. And this applies to drilling and geophysics companies alike. This growth chiefly occurred by external growth. This strategy enables the companies using it to boost their production (or services) capacity rapidly. For example, Nabors Industries, a drilling firm, which made 15 external growth operations since 1990 has seen its number of drilling rigs in activity rose from 111 in 1990 to 542 in 1999.

The second trend in the companies making up the competitive fringe is the broadening of the range of services. 50% of the companies have pursued such a strategy. Unlike the companies of the oligopoly, this integration of services rarely extends beyond the initial segment to which the firm belonged: for a seismic firm, it first tries to propose comprehensive seismic services (and similarly for drilling companies). For example, the Norwegian firm Petroleum GeoServices broadened the range of its services in 1993 with the acquisition of Tensor (large acquisition and processing capabilities) and the acquisitions of ERC, Mapware and Woodlands, which enabled the PGS group to develop seismic software operations. Between 1994 and 1998, PGS extended its services to seismic acquisition in shallow waters following the acquisition of the assets of Eastern Geophysical and Northern Geophysical and of the firm Acadian. Today, like CGG, PGS is active in every aspect of seismics (acquisition, processing, interpretation, data management, software, etc). This development is also significant in the drilling industry.

Examples of e-business in the competitive fringe are still hard to find. The only significant example is the creation of an electronic portal (OFS Portal) in partnership with 11 service industry companies[4]. The aim of this joint venture is to supply a standardized electronic catalog to the customers as well as an information service on products and services offered by the participants.

To conclude, service industry companies on the competitive fringe follow the strategic moves of the oligopolistic firms. Yet the imitation is not clearly and distinctly perceptible in terms of time. Imitation takes place with a certain lag, which varies according to the innovations.

Consolidation Prospects of the Oil and Gas Supply and Service Sector

Drilling is a market left vacant by the oligopoly, and this is why we will very probably witness a new wave of consolidations in the drilling sector. This trend has already begun with the attempt to buy R&B Falcon by Transocean Sedco-Forex in 2000. This will place the new firm in the top rank worldwide offshore drilling.

Moreover, the acquisition of the Baker Hughes seismic operations by Schlumberger in 2000 was perceived as an offensive maneuver by the geophysics companies in the competitive fringe. To strike back, it is also very likely that these seismic firms will seek consolidation through large scale mergers. Why not imagine a merger between CGG, PGS and/or Veritas?

Thus it appears clearly that the oil and gas supply and service sector has not yet completed its restructuring, and that the wave of consolidations will continue in the coming years, in the patterns that we have described.

Insofar as a few firms dominate the industry, they serve as a "test" in strategic terms for smaller companies. This was in fact what Porter said (1982) when he stated that the competitive battle between the groups of the industrial sector is one of the types of competition. Thus the developments discussed above offer an original justification for the concentration of a sector. The results that we obtain enable us in fact to justify the wave of consolidation of the companies by the fact that they emulate the strategies implemented by competing firms.

Footnotes

[1] Schumpeter does not overlook the role played by transforma-

(continued next page)

tions of the social and natural environment (like wars and revolutions) of economic life in the evolution of capitalism. Nor does he overlook the growth of population and capital, or the role played by monetary systems. However, the basic impetus is the implementation of the innovations as he defines them.

[2] Creation of a research laboratory in Austin because of the growing use of softwares and computers in oil and gas service operations. Similarly, Schlumberger acquired Geoquest Systems in 1992.

[3] Acquisitions of 25% of GECO in 1988, of Sonics in 1989, of Deft Geophysical in 1990, of 51% of Prakla-Seismos in 1991 and Seismograph Service in 1992. This wave of seismic acquisitions followed a first wave which began before the oil aftershock.

[4] ABB, BJ Services, Cooper Cameron, ENSCO, FMC, Halliburton, National Oilwell, Schlumberger, Smith International, Transocean Sedco-Forex and Weatherford. The interesting point is that the three service industry majors participate in this joint venture.

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ANNEX 1: THE THREE LEADERS IN THE OIL AND GAS SUPPLY AND SERVICE INDUSTRY

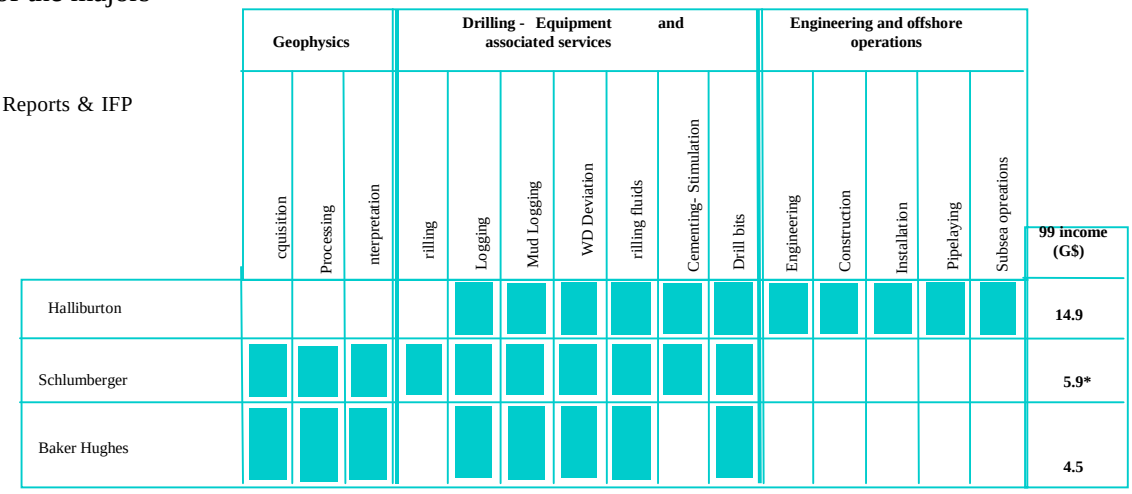
➢Size of the three majors

31/12/1999	Stock market Capitalization on 8/4/2000 (M$)	Income (M$)	Asset Value (M$)	Workforce (thousands)	International Presence
Halliburton (United States)	21427	14898	10728	103	Active in 122 countries, including the United States (32% of income) and the United Kingdom (12%).
Schlumberger (United States – France)	44289	8395	15081	55	Internationally active. For oil and gas services, North America accounts for 25% of income and the Europe/ CIS/West Africa zone 23%.
Baker Hughes (United States)	12073	4547	7040	27	Active in 70 countries, including the United States (37% of income), the United Kingdom (9%) and Norway 6%).

Source: 1999 annual reports

➢Integration of the majors

Source: Annual Reports & IFP



* "Oil and gas services" income

IAEE Session at the Annual ASSA/AEA Conference

Atlanta, GA – January 4-6, 2002

The International Association for Energy Economics will be holding its 4th Annual Session at the Allied Social Science Association meeting in Atlanta, Georgia, January 4-6, 2002. We hope to see you there.

Session Title: Current Issues in Energy Economics and Energy Modeling (Q4)

Presiding: Carol Dahl, Colorado School of Mines

Onno Kuik and Reyer Gerlagh, Institute for Environmental Studies, Vrije Universiteit, Amsterdam, The Netherlands-The Effect of Trade Liberalisation on Carbon Leakage under the Kyoto Protocol: Experiments with GTAP-E

Abstract

Energy- en carbon-intensive industries in the Annex I countries fear that unilateral carbon abatement measures as agreed upon under the Kyoto Protocol will harm their competitiveness, endanger employment, and will not improve the environment because of carbon leakage. There have been a number of studies that analysed the mechanisms and that have provided quantitative estimates. Of the many factors that potentially affect competitiveness of energy-intensive industries and the rate of carbon leakage, changes in import tariffs and other trade barriers have received little attention in the literature. This paper aims at filling the gap by introducing in the calculations the implementation of the Uruguay Round of multilateral trade negotiations. The estimations are made with a static, multi-sector, multi-region applied general equilibrium model (GTAP-E) that allows for inter-fuel and inter-factor substitutions. We find that under a plausible range of assumptions, the implementation of the Uruguay Round reductions of import tariffs (i) increases the rate of carbon leakage from around 14 percent-points to about 17 percent-points, but (ii) does not reduce the competitiveness of energy-intensive industries in Annex 1 countries.

While all reservations that one can have regarding the reliability of the numbers produced by these kinds of model calculations are valid (and wise), the analysis is intuitively appealing. Unilateral carbon reduction policies in the North are partly offset by carbon leakage to the South. The main route of carbon leakage is due to the substitution of fuels by Southern producers and households for other production factors and consumption goods. Changes in scale and composition of industry are modest in both Annex I and non-Annex I countries. Comparative advantages do not disappear overnight. While trade liberalisation increases competition between countries, possibly enhancing the carbon leakage and the welfare loss in the Annex I countries (the Pollution haven hypothesis), it also leads to a further specialisation towards energy and capital intensive industries in the North while the opposite occurs in the South (the Factor Endowment hypothesis). The net effect of trade liberalisation under the Uruguay Round seems to be a modest increase in the rate of carbon leakage.

Peter H. Griffes, Analysis Group / Economics, San Francisco, CA-Have Economies of Vertical Integration Held up in the Electric Utility Industry?

Abstract

The structure of the electric utility industry is undergoing great change. In some regions, such as California and New England, restructuring has separated the utilities' generation and delivery functions. One feature of this transformation has been the introduction of a new type of firm to coordinate between generation and delivery on a short-term basis. The California Power Exchange and New York ISO are examples of these new entities. The concept of reformulating the industry is squarely based on the premise that any loss in economies of vertical integration would be more than offset by the reduction in costs that competition in generation would bring.

A hallmark of electricity restructuring has been the separation of the generation, coordination and delivery functions. In a vertically integrated structure, these functions are embedded within the same firm. Under the new structure, they reside in separate firms. The theory of the firm states that long-term contracts may substitute for vertical integration. It is an empirical question as to how well the new structure preserves the vertical economies found in a single firm.

Previous studies have examined the extent of economies of integration in electric utilities. They generally have found varying degrees of vertical economies. However, they all have relied on data from periods before restructuring took place. Further, they have not explicitly taken account of the role of the coordinating firms in their estimation.

In this paper, we examine the question of vertical integration in electric utilities using data from a more recent period. These data include firms that specialize in generation, coordination and delivery that were previously parts of an integrated firm. Because some regions have not yet undertaken restructuring, we include vertically integrated utilities in the analysis. In particular, we estimate the degree to which the new market structures have preserved the economies from vertical integration that are present in vertically integrated firms.

Lynne Kiesling and Adrian Moore, Los Angeles, CA Dynamism-Discovery and Power: An Austrian Analysis of Electricity Deregulation, Reason Public Policy Institute and the Northwestern University

Abstract

To what extent do the benefits associated with markets in an Austrian framework occur in the electricity industry? The industry is historically characterized by high fixed costs and economies of scale, leading to a natural monopoly over the relevant range of demand. Electricity is not storable, and it is difficult and costly to transport over long distances. Therefore the electricity market tends to be regional and to have inelastic demand and supply, with the technical characteristics of electricity providing constraints on how elastic demand and supply could be. In addition, the recent experience in California has prompted widespread allegations that competitive markets for electricity are not technically feasible nor politically desirable.

Yet an Austrian economic analysis sheds considerable light on the potential for competition and discovery in deregulated electricity markets, and reveals the problems in many specific policies often folded into "deregulation" proposals. Our analysis begins with the understanding that the electricity industry is evolving away from being an

industry based on transactions for physical goods, and toward transactions involving exchanges of rights.

We use this information-theoretic approach to show the extent to which information matters in an industry like electricity, which is susceptible to changing cost structures with technological change, and for which information provision to and from market participants can dramatically change the price elasticities of supply and demand. We explicitly draw the connection between information sets and opportunity costs facing industry participants. Changes in the information sets of industry participants lead to substantial dynamic changes in market structure. We also use our model of the information sets of industry participants to discuss the importance of transaction costs, and how changes in transaction costs over time influence market structure (in issues such as vertical integration).

We further incorporate several intertemporal dimensions of information in the electricity industry, starting with the importance of parties contracting on their own terms (unlike the recent experience in California). A perspective on deregulation that is flexible and allows parties to determine and negotiate their own contractual terms communicates important information about expectations, opportunity costs and risk aversion.

An Austrian analysis of the electricity industry suggests that information provision is a crucial component of the benefits of deregulation. Increased information would decrease the transaction costs associated with transacting through a market process instead of an alternate institutional structure (such as internally within a firm, or a regulated utility framework). Decreasing transaction costs increase the probability of achieving more dynamically efficient outcomes that benefit consumers and engender creativity and dynamism in the electricity industry.

Discussants: Roy Boyd, Ohio University, Athens, OH
Gale A. Boyd, Argonne National Laboratory, Chicago, IL
Sherman Folland, Oakland University, Rochester, MI

For complete ASSA meeting highlights and pre-registration information please visit:
http://www.vanderbilt.edu/AEA/index.htm

For updated information regarding the IAEE Session at the ASSA meeting please visit the IAEE website at: www.iaee.org/conferences/conferences.asp

!!!! Congratulations to Michelle Foss !!!!

Michelle Foss has been appointed to the Board of Directors of GridSouth Transco, LLC. GridSouth Transco is a new regional transmission organization, formed under the U.S. Federal Energy Regulatory Commission's Order 2000, which encourages creation of larger electric power market areas in the U.S. GridSouth Transco will operate the transmission assets of Duke Energy, Carolina Power & Light (Progress Energy) and SCANA (South Carolina Electric & Gas), with 22,000 miles of transmission lines connected to approximately 34,500 magawatts of electric generation servicing more than 3.75 million customers in North Carolina and South Carolina. For more information about GridSouth please visit www.gridsouth.com

International Association for Energy Economics Student Scholarships

The IAEE Council is seeking nominations for 2001 IAEE Student Scholarships. The scholarships have been established in order to reward and support the studies of outstanding students of energy economics, especially those normally resident in emerging economies.

It is planned to make 5-7 awards of US$2000 each for 2001. The successful recipients will be studying energy economics or a related energy discipline at an internationally recognised university. They will also receive free membership in the IAEE for five years and admission to one IAEE international conference between 2002 – 2003.

The awards will be made by a committee of IAEE Council members comprising of Dr. Len Coburn (US Department of Energy), Prof. Jean-Philippe Cueille (Institut Francais du Petrole) and Dr. Arnold B. Baker (Sandia National Laboratories). Their decisions will be final. A list of award recipients will be published in the ***IAEE Newsletter***.

Applications should be accompanied by a brief explanation as to why the applicant considers him/her self worthy of the award together with a letter of recommendation from the student's advisor (in confidence if desired). Applications will close 31 October 2001 and awards will be announced by 30 November 2001.

Applications for scholarships should be mailed to:

David L. Williams, Executive Director
International Association for Energy Economics
28790 Chagrin Boulevard, Suite 350
Cleveland, OH 44122 USA
Fax: 216-464-2737
Email: iaee@iaee.org

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Conference Proceedings on CD Rom
24th International Conference
Houston, Texas, USA April 25-27, 2001

The Proceedings of the 24th International Conference of the IAEE are available from IAEE Headquarters on CD Rom. Entitled *2001: An Energy Odyssey*, the price is $85.00 for members and $105.00 for non members (includes postage). Payment must be made in U.S. dollars with checks drawn on U.S. banks. Complete the form below and mail together with your check to:Order Department, IAEE, 28790 Chagrin Blvd., Suite 350 Cleveland, OH 44122, USA.

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Please send me ____ copies @ $85.00 each (member rate) $105.00 each (nonmember rate).
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Publications

Global Change Associates has published a special report on **Enron Corp: An Inside View**. The report is available at www.global-change.com . Contact details are tel: 212-625-1711, fax is 212-625-8810 or mail at 225 Lafayette Street, Ste 1206, NY, NY 10012.

Nuclear Power in the OECD, John Paffenberger (2001). 320 pages. Price: $120.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Dealing With Climate Change – National Policies and Measures (2000). 180 pages. Price: $100.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

The Road from Kyoto: Current CO2 and Transport Policies in the IEA (2000). 120 pages. Price: $75.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Electricity Reform: Power Generation Costs and Investment (2000). 124 pages. Price: $50.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Electric Power Technology: Opportunities and Challenges of Competition (1999). 60 pages. Price: $40.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Regulatory Reform: European Gas (2000). 128 pages. Price: $75.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

South East Asia Gas Study (2000). 80 pages. Price: $50.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Automotive Fuels for the Future: The Search for Alternatives (1999). 96 pages. Price: $100.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

China's Worldwide Quest for Energy Security (2000). 85 pages. Price: $100.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Oil Supply Security: The Emergency Potential of IEA Countries (2001). 300 pages. Price: $100.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Energy: The Next Fifty Years (1999). 200 pages. Price: $29.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

The Future Role of Coal: Markets, Supply and the Environment (1999). 156 pages. Price: $80.00. Contact: OECD Washington Center, 2001 L St, NW, Ste 650, Washington, DC 20036-4922. Phone: 800-456-OECD. Fax: 202-785-0350.

Calendar

27-31 August 2001, Corporations, Communities, Human Rights and Development. Contact: Mrs Moira McKinlay, Seminar Co-ordinator, CEPMLP, Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: +44 (0) 1382 344303. Fax: +44 (0) 1382 345854 Email: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

3-7 September 2001, Negotiation and Documenting Petroleum Industry Transactions. Contact: Mrs Moira McKinlay, Seminar Co-ordinator, CEPMLP, Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: +44 (0) 1382 344303. Fax: +44 (0) 1382 345854 Email: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

6-7 September 2001, Beijing Oil Forum at Beijing International Convention Center. Contact: Huaibin Lu, Conference Executive Secretary, 3E, 40 Whitman Road, Suite 1-2, Waltham, MA, 02453, USA. Phone: 781-894-4798. Fax: 781-894-5792 Email: hlu@3-eee.net / 3e@3-eee.com

6-7 September 2001, Bonbright Center Energy Conference at Atlanta, GA. Contact: Office of Executive Programs, Terry College of Business, University of Georgia, 278 Brooks Hall, Athens, GA, 30602-6262, USA. Phone: 706-542-1964. Fax: 706-542-8374 URL: www.terry.uga.edu/bonbright/

7-8 September 2001, Pacific Petroleum Insiders Downstream at Rafflels Hotel, Singapore. Contact: Conference Connection Administrators P/L, 212 A, Telok Ayer St, Singapore, 068645, Singapore. Phone: 65-226-5280. Fax: 65-226-4117/4092 Email: facts@cconnection.org

10-10 September 2001, Sustainable Development & The Resource Sector: Regulatory Drivers & Corporate Response at Maritime Campus, University of Greenwich. Contact: Mrs. M. McKinlay, CEPMLP, University of Dundee, Dundee, DD1 4HN, Scotland. Phone: 44-1382-344303. Fax: 44-1382-345854 Email: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

10-14 September 2001, Natural Gas Negotiations and Contracts. Contact: Mrs Moira McKinlay, Seminar Co-ordinator, CEPMLP, Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee, Dundee, Scotland, UK. Phone: +44(0)1382 344303. Fax: +44(0)1382 345854 Email: m.r.mckinlay@dundee.ac.uk URL: www.cepmlp.org

10-12 September 2001, Energy Economy 2001 at Houston, Texas. Contact: Nancy Aloway, Event Director, Energy Economy, PennWell, 1521 S Sheridan Road, Tulsa, OK, 74112, USA. Phone: 918-831-9438. Fax: 918-832-9201 Email: nancya@pennwell.com

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10-12 September 2001, Energy Economy 2000 at Houston, Texas - USA. Contact: Nancy Aloway, Event Director, PennWell, 1421 South Sheridan Road, Tulsa, OK, 74112-6600, USA. Phone: 918-831-9438. Fax: 918-832-9201 Email: nancya@pennwell.com URL: www.pennwell.com

17-21 September 2001, Fifth International Biomass Conference of the Americas, Orlando, Florida, USA at Rosen Centre Hotel. Contact: Organizers: U.S. Department of Energy, U.S. Department of Agriculture, Nat'l Resources Canada & the Nat'l Renewable Energy Lab. Phone: 321-638-1527 Email: joann@fsec.ucf.edu URL: www.nrel.gov/bioam

17-19 September 2001, GIS for Oil & Gas Conference at Houston, TX. Contact: Geospatial Information & Technology Association, 14456 East Evans Avenue, Aurora, CO, 80014, USA. Phone: 303-337-0513. Fax: 303-337-1001 Email: info@gita.org URL: www.gita.org

17-18 September 2001, China-Asia Col: Markets & Technology at Beijing, China. Contact: Sandy Leong, Event Administrator, Centre for Management Technology, 80 Marine Parade Road, #13-02 Parkway Parade, Singapore, 449269, Singapore. Phone: 65-345-7322. Fax: 65-345-5928 Email: sandy@cmtsp.com.sg

18-21 September 2001, The Commercial, Economic and Trading Aspects of Oil Refining at Gorse Hill, Woking, UK. Contact: The Petroleum Economist, PO Box 105, Baird House, 15/17 St Cross Street, London, EC1N 8UW, United Kingdom. Phone: 44-20-7831-5588. Fax: 44-20-7831-4567/5313 Email: jones@petroleum-economist.com URL: www.petroleum-economist.com

19-21 September 2001, 3rd International Energy Symposium at Stift Ossiach, Austria. Contact: Verbundplan, Kohldorfer Str. 98,, A-9020 Klagenfurt, Austria. Phone: 43 1 53605 32560. Fax: 43 463 202 32584 Email: reutera@verbundplan.at URL: www.energysymposium.at

20-21 September 2001, Investments and Risk management in a liberalised electricity market at Hotel Sophie Amalie, Copenhagen, Denmark. Contact: Ph.D student Jacob Lemming, M.Sc, Risø National Laboratory, Frederiksborgvej 399, PO 49, Roskilde, 4000, Denmark. Phone: (+45) 46775142. Fax: (+45) 46775199 Email: jacob.lemming@risoe.dk URL: www.student.dtu.dk/~s948397/index.htm

20-21 September 2001, Pricing in Electric Markets at Atlanta, GA, USA. Contact: Center for Business Intelligence, 500 W Cummings Park, Suite 5100, Woburn, MA, 01801, USA. Phone: 781-939-2438. Fax: 781-939-2490 Email: cbireg@cbinet.com URL: www.cbinet.com

20-21 September 2001, Energy Investor Summit at San Francisco, California. Contact: Strategic Research Institute, 236 West 27th Street 8th Floor, New York, NY, 10001, USA. Phone: 646-336-7030. Fax: 646-336-5891 Email: info@srinstitute.com URL: www.srinstitute.com

24-26 September 2001, Powering the Future at Chicago, IL. Contact: Intertech Conferences, 19 Northbrook Office Park, Portland, ME, 04105, USA. Phone: 207-781-9623. Fax: 207-781-2150 Email: bwilkie@intertechusa.com URL: www.intertechusa.com

24-25 September 2001, North American Gas Supply Symposium at Houston, Texas, USA. Contact: Center for Business Intelligence, Registration Dept., 500 W Cummings Park, Suite 5100, Woburn, MA, 01801, USA. Phone: 781-939-2438. Fax: 781-939-2490 Email: cbireg@cbinet.com URL: www.cbinet.com

24-25 September 2001, Deregulation: Curse or Cure? at Warwick Hotel, Philadelphia, PA. Contact: Chris Dauer, Strategic Research Institute. Phone: 212-967-0095 Email:

IAEE Newsletter

Volume 10, Third Quarter 2001

The *IAEE Newsletter* is published quarterly in February, May, August and November, by the Energy Economics Education Foundation for the IAEE membership. Items for publication and editorial inquiries should be addressed to the Editor at 28790 Chagrin Boulevard, Suite 350, Cleveland, OH 44122 USA. *Phone:* 216-464-5365; *Fax*: 216-464-2737. Deadline for copy is the 1st of the month preceding publication. The Association assumes no responsibility for the content of articles contained herein. Articles represent the views of authors and not necessarily those of the Association.

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