

IA INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS
EE
Newsletter

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Second Quarter 1999

President's Message

The first quarter of 1999 has proved to be a further turbulent period for energy markets. We have experienced yet another mild winter in the Northern Hemisphere which has accentuated the global energy capacity surplus, especially in oil and natural gas markets. The result has been a continuation of very low energy prices and severe financial pressures on energy producing states and companies. However, we have also begun to see the beginnings of adjustment.

Economic fundamentals and financial constraints have triggered large cuts in the oil and gas industry's capital expenditures, with budgets being cut by an average of 25-30 percent. Rig counts and wells drilled have both dropped sharply. Meantime, in face of these pressures, OPEC member oil producers and a number of large non-OPEC producing states met in the Hague in late March and later in Vienna and agreed to cut oil production by some two million b/d in order to rebalance the oil market and erode the inventory overhang. Crude oil prices have rallied, but not returned to previously prevailing levels.

Meanwhile, the IAEE agreed on 1 April to award its first ever student scholarships in order to support students of energy related disciplines in their studies. A fuller description of the scheme and the successful candidates is included on page 10. The scheme has been designed to spend a proportion of the accrued revenues of the IAEE in support the study of energy economics, especially by students of emerging market economies.

The coming few months will see three major IAEE supported conferences. The 22nd annual Conference of the IAEE will take place in Rome on the 9-12 June with the title "New Equilibria in the Energy Markets: the Role of New Regions and Areas" (see http://www.euronet.it/aiee/iaee_conference.htm for fuller details). Edgardo Curcio and his colleagues from the Italian Association-the AIEE-have been working extremely hard to ensure that this will be a very successful and enjoyable event. This will be followed in the

late summer and early autumn by three regional conferences: the USAEE/IAEE 20th Annual North American Conference in Orlando, Florida on August 29-1 September (see <http://www.iaee.org/20nacinv/20nacinv.htm>); the British Institute of Energy Economics (BIEE) 1999 Conference at St John's College Oxford on 20-1 September (see <http://www.iaee.org/97sptconf/99biee.htm>); and on 30 September-1 October the French affiliate will be holding its annual event in Paris. I do hope that you will be able to attend and participate in at least one of these world class energy conferences.

Peter Davies

Editor's Note

Widhiyawan Prawiraatmadja and Fereidun Fesharaki provide an update on the Asia oil industry and the impact the area's financial crisis is having on it. A look at the oil sector in each of the areas major countries is provided. They note that though weak Asia demand had added downward pressure on oil prices, the role of lower Asia demand growth is actually very small compared with potential global oversupply. Further, they note that in most of the Asian countries currency depreciating effects are more than offset by the decline in oil prices in the international markets. Oil demand growth is expected to resume this year and reach a new peak next year.

Jacques Percebois looks at the efforts to deregulate the European gas market, describing first the present situation and then outlining the Gas Directive adopted by the European Commission and the implementation strategies by the oil companies. He concludes with a summarization of the questions remaining regarding the transposition of the Directive into the laws of the European countries.

Laszlo Lovel of the World Bank reports on the progress of electricity energy market reform in the Ukraine. He notes that despite the fact that it was relatively easy to put in place the basic facilities/systems for a functioning competitive electricity market, the Ukrainian government has been reluc-

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

The Structure of the Energy Industries: The Only Constant is Change

20th USAEE/IAEE Annual North American Conference - August 29 - September 1, 1999
Orlando, Florida, USA - Hilton at Walt Disney World Village

If you're concerned about the future of the energy industry and profession, this is one meeting you surely don't want to miss. The 20th USAEE/IAEE Annual North American Conference will detail current developments within the energy field so that you come away with a better sense of energy supply, demand and price. Some of the major conference themes and topics are as follows:

Oil Industry Restructuring	The Climate Change Debate	Natural Gas Markets in the New Century
Electricity Restructuring	Global Gas & Power	Alternative Fuel Vehicles
	The Global Economy and its Effect on the Energy Industry	

Economic upheaval, globalization, privatization and regulatory reform are having significant impacts on energy markets throughout the world. All of the major energy industries are restructuring through mergers, acquisitions, unbundling and rebundling of energy and other services. This conference will provide a forum for discussion of the constantly changing structure of the energy industries, with insights into the causes and likely outcomes of the restructuring efforts that are not underway.

At this time, confirmed speakers include the following:

J. Christopher Allen, Reliant Energy Wholesale Group	Brad Bates, Ford Motor Company
Mark Bernstein, RAND Corporation	Stephen P. Brown, Federal Reserve Bank of Dallas
Robert Campbell, Chairman & CEO, Sunoco, Inc.	Tom Cackette, California Air Resources Board
Herman Franssen, Petroleum Economics Limited	Joe Foster, Newfield Exploration
William W. Hogan, Harvard University	Karl Georg Jechoutek, World Bank
John Jurewitz, Southern California Edison Company	Jim Katzer, Mobil Oil
Ran Khatti, Valero	Prakash Loungani, IMF
Michael C. Lynch, MIT	Terrance McGill, Columbia Gulf Transmission Company
Knut Anton Mork, Svenska Handelsbanken	Adam Sieminski, BT Alex Brown, Inc.
Matt Simmons, Simmons & Company	Kyle Simpson, Morgan Meguire, LLC
Ronald Sutherland, American Petroleum Institute	Michael L. Telson, CFO, U.S. Department of Energy
Barbara Laflin Treat, Bechtel Corporation	Scott Woronuk, TransCanada Energy

A special added feature of this year's conference is designed to contribute to our understanding of the technical underpinnings of energy markets. On Sunday, August 29, the conference will offer two one-hour tutorials - one entitled "Petroleum Refining for the Non-technical Person" presented by William Leffler (Shell Oil Company) and a second on "The Basics of Electricity" by Stephen Connors (MIT). The closing session is entitled "Looking Ahead by Looking Back." We have brought together three energy industry wise men, John Boatwright, Laney Littlejohn and Omic Marashian to evaluate current energy market developments against the backdrop of their combined experience in the energy industries.

In addition, 25 concurrent sessions are planned to address timely topics that affect all of us specializing in the field of energy economics. Sessions under development or consideration include:

Modeling Competitive Electricity Markets	Environmental Analysis and Regulation
Doing Energy Business in the Information Age: Removing the Barriers	U.S. Oil Policy
Energy Reform in Transition Economies	The Outlook for Coal and Nuclear Power
Oil Supply Outlook: International Projections	Environmental Issues in the Developing World
Evolving U.S. Natural Gas Markets	Convergence in the Utility Industries
Latin American Deregulation	Global Change: Economic and Energy Policy Implications
Globalization of the Electricity Industry	Energy Efficiency in a Glutted Market
Energy Modeling: Past, Present and Future	A New OPEC?
Market Power in the Transmission Industries - (NG & Electricity)	Distributed Generation

Though the abstract cut-off date has passed, if you still desire to present a paper in a concurrent session, please contact Dave Williams (iaee@iaee.org) to see if there are any available spots still left in the program that may fit your area of energy expertise.

The 20th USAEE/IAEE Annual North American Conference provides a unique opportunity for leading experts from business, government, universities, and research institutions to discuss and debate the future of energy markets in this era of commodization, decentralization, and internationalization. The meeting will emphasize the applicability of the most recent, cutting-edge analysis for helping private and public organizations frame decisions and choose appropriate strategies.

Orlando, Florida is a wonderful and scenic/tourist place to meet. Single nights at the Hilton Hotel are \$139.00 (contact the Hilton Hotel at 407-827-4000, to make your reservations). Conference registration fees are \$475.00 for USAEE/IAEE members and \$575.00 for non-members. Special airfares have been arranged through Continental Airlines. Please contact Continental by calling 281-821-9549 and reference our discount code "IMBIGHT." These prices make it affordable for you to attend a conference that will keep you abreast of the issues that are now being addressed on the energy frontier.

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

The Structure of the Energy Industries: The Only Constant is Change

20th Annual North American Conference of the USAEE/IAEE

Please send me further information on the subject checked below regarding the August 29 - September 1, 1999 USAEE/IAEE Conference.

Registration Information Sponsorship Information Exhibit Information Speaker Information

NAME : _____ TITLE _____
COMPANY : _____
ADDRESS : _____
CITY, STATE, MAIL CODE : _____
COUNTRY : _____ PHONE/FAX : _____

USAEE/IAEE Conference Headquarters
28790 Chagrin Blvd., Suite 350 • Cleveland, OH 44122 USA
Phone: 216-464-2785 Fax: 216-464-2768

22nd IAEE Annual International Conference

New Equilibria in the Energy Markets: The Role of New Regions and Areas

Rome, Italy 9-12 June 1999

Grand Hotel Parco dei Principi

Organized by the IAEE Italian Affiliate - AIEE

The Conference will be composed of 10 general sessions and 40 concurrent sessions with an expert team of 200 distinguished speakers who will give those attending a clear picture of the commercial, regulatory and competitive sectors currently emerging in these markets.

Some 200 abstracts have already been submitted, dealing with new energy markets, the experiences of liberalisation, regulation and deregulation in the energy markets, Post-Kyoto follow up, energy scenarios, energy demand and efficiency and the role of technologies in a sustainable development.

The Conference will be a unique opportunity to debate about current developments with high-level representatives of key industry and international institutions who have already confirmed their participation, among which ENI, BP, SHELL, ENEL, EDF, SNAM, BG as well as IEA, IPCC, IFP, World Bank and the European Commission, all representing more than 35 countries.

The Official Opening will be held by the Italian Minister of Industry, Mr. P. Bersani, followed by the keynote address of Mr. Guglielmo Moscato, Chairman of ENI. The general sessions will then debate on the issues related to the Kyoto Protocol Implementation, New Region and Big Projects, the Electricity Markets in the Mediterranean, Gas Demand and Supply in Europe, the Evolution of Big Energy Company in the 21st century and Technologies Innovation.

The Closing Remarks will be addressed by the Director of EC and by the Italian Under-Secretary of Foreign Affairs.

In addition to a highly professional programme, the Conference will be the opportunity for delegates and accompanying persons to enjoy many cultural visits and social events throughout Rome.

A private guided visit to the Vatican Museums and the Sistine Chapel will be organised on June 9; the following day, participants and their guests will be invited to a gala dinner in a XVIIIth Villa and on June 11 an exclusive concert in a Roman Basilica will be offered to them. At the end of the conference, on June 12 all ladies will be invited to a special fashion show at Grand Hotel Parco dei Principi.

Before the Conference, on June 7 and 8 a variety of interesting technical tours will be organised for participants to provide them with on site presentation to some industrial plants located in three Italian attractive regions and to make them enjoy Italy's wealth of art and culture: participants will have the opportunity to visit ENEL geothermal fumaroles and power stations in Lardarello (Tuscany), ENI offshore gas platforms at Ravenna (Adriatic Sea) and ENEA Photovoltaic R & D Center at Portici (Naples).

Other cultural tours and excursions throughout Rome, Florence and other cities will be offered at special rates to delegates and accompanying persons.

For further information or registration details, please contact:

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Update on the Oil Industry in Key Asian Countries: Implications of the East-Asian Economic Crisis and Lower Oil Prices in the International Market

*By Widhyawan Prawiraatmadja and Fereidun Fesharaki**

The Current Characteristics of the Asian Oil Market

While the economic/financial crisis in some Asian countries has had a serious impact on the region's energy market, the Asia-Pacific oil market needs to be assessed within the context of lower oil prices in the international market and continued deregulation policies in some key countries.

We believe that lower oil prices are likely to prevail for quite some time. Political events can push up the price temporarily, but the current potential oversupply will bring the price down to the level where the price of Brent will fluctuate within a band of US\$12.00-15.00 per barrel for at least the next five years. Our base-case projection indicates that the yearly average of oil prices in real terms until 2010 will not exceed the 1996/97 levels.

While the weak Asian oil demand adds downward pressure on oil prices, the role of lower Asian demand growth is actually very small compared with the potential global oversupply. Lower oil prices also mean lower import bills for many Asian countries; this has particularly helped the balance of payments of the countries hampered by the economic/financial crisis, with the exception of the net oil exporting countries: Indonesia and Malaysia. The lower oil prices dampen the impact of the currency depreciation in the crisis countries on their domestic retail prices. However, cutting the value of a currency in half, for example, does not double the consumer price; it merely doubles the "landed" (or CIF) prices. Since supplying the domestic market also entails other costs and taxes in local terms, in most cases domestic prices change by less than the CIF change. These phenomena are exemplified in Table 1, which shows retail gasoline prices in key Asian countries, especially the ones that are affected by the crisis.

Table 1 shows changes in average gasoline prices between June 1997 and June 1998, providing a comparison of the situations both during and prior to the crisis. Table 1 also provides October 1998 prices for further comparison. International market prices in the Asia-Pacific region are represented by the Singapore spot (FOB) prices, which had declined earlier by 27% between June 1997 and June 1998. Despite lower prices in the international market—hence CIF prices (in US dollars) in all countries over the same period—domestic prices (in local currencies) in countries experiencing currency depreciation had increased, with the exception of Japan. This means that in most countries, currency depreciation effects are more than offset by the decline in oil prices in the international market. However, it is clear that had the international market prices not declined, domestic oil prices in those countries would have been much higher, resulting in a more negative impact on their respective

* Fereidun Fesharaki and Widhyawan Prawiraatmadja are with the East-West Center in Honolulu, Hawaii where Fesharaki is Director of the Energy Program. The article is reprinted from the East-West Center's Energy Advisory, Number 222, December, 1998.

economies.

Table 1
Comparison of Gasoline Prices: Domestic Retail and International Market

				Change	
		Jun-97	Jun-98	Jun-97/	Oct-98
		Jun-98/			
Bangkok, Thailand	Baht/liter	9.59	12.37	29%	11.09
	Baht/US\$	24	40	68%	38.37
	US\$/gallon	1.51	1.16	-23%	1.09
Beijing, China	Yuan/ton	3000	3000	0%	2.883
	Yuan/US\$	8.30	8.30	0%	8.28
	US\$/gallon	1.01	1.01	0%	0.98
Jakarta, Indonesia	Rupiah/liter	700	1000	43%	1.000
	Rupiah/US\$	2450	14500	492%	7600
	US\$/gallon	1.08	0.26	-76%	0.50
Kuala Lumpur, Malaysia	Ringgit/liter	1.10	1.10	0%	1.10
	Ringgit/US\$	2.52	4.12	63%	3.80
	US\$/gallon	1.65	1.01	-39%	1.10
Manila, The Philippines	Peso/liter	10.94	11.69	7%	11.76
	Peso/US\$	26	42	62%	40
	US\$/gallon	1.59	1.05	-34%	1.11
Seoul, Korea	Won/liter	824	1088	32%	1215
	Won/US\$	885	1380	56%	1328
	US\$/gallon	3.52	2.98	-15%	3.46
Tokyo, Japan	Yen/liter	100	86	-14%	92
	Yen/US\$	115	138	20%	116
	US\$/gallon	3.29	2.36	-28%	3.00
Singapore, FOB	US\$/barrel	23.70	17.20	-27%	15.27
	US\$/gallon	0.56	0.41	-27%	0.36

The current changes in domestic product prices—hence changes in each country's oil demand and supply—may stem from the currency depreciation and lower oil prices. But in some key countries, this phenomenon is inextricably entangled with regulation/deregulation policies. Regulation (or deregulation) has a profound impact on domestic product prices, hence its impact on the country's oil demand and product balances, and on petroleum trades. In Japan, for example, retail prices for gasoline have been depressed, as shown in Table 1, because of the liberalization of product import policies, despite the country's currency depreciation against the US dollar. On the other hand, where prices are regulated, such as in Indonesia and China, price changes (by government fiat) are not necessarily related to international market prices.

Implications for Key Countries

Owing to the severity of the economic/financial crisis, we classify the affected countries into:

- Serious crisis countries: Indonesia, Thailand, and South Korea
- Cross-fire countries: Malaysia, the Philippines, and to a lesser extent Singapore.

Japan has its own prolonged economic crisis, and its recovery is crucial, in order to support the economic rebound of other countries in crisis. Other key countries in Asia may not be directly in economic crisis but have certainly gotten the

spillover in the form of lower-than-expected economic growth. The latter include China, India, and Taiwan.

The following paragraphs discuss the current situation of all the countries mentioned above, especially in terms of the implications for their respective oil industries.

INDONESIA

Among all these countries, Indonesia has been hit hardest by the economic crisis. The country has to overcome its political instability first; economic recovery can be expected only after the political problems are resolved. For 1998, the overall GDP in Indonesia is expected to shrink significantly—by as much as 15%. New elections are planned for May 1999, but it remains to be seen whether the country can elect a legitimate leader and hence stable government.

Until recently, Indonesia's currency had lost as much as 80% of its value since July 1997, which was shortly before the crisis began. Although it has strengthened lately, Indonesia's currency still fluctuates widely, mirroring the development of domestic political events. Inflation in the first half of 1998 reached 60% causing interest rates to soar. Prices of basic goods have at least doubled, compared with the pre-crisis period.

In many industries, production has come to a halt, causing massive lay-offs of workers. Dissatisfied Indonesians have taken their frustrations to the streets and caused riots in several cities.

Impact on the Indonesia Oil Sector

- Less-than-expected petroleum export revenues in this particularly difficult time hamper the government budget. This proves to be a very significant factor, since it limits the government's ability to "fund" policies that can buffer the economic woes.
- In May 1998, domestic petroleum product prices were raised by an average of 38% in the local currency, but in US dollar terms the prices were still much lower than international market prices. This has resulted in massive government subsidies.
- Demand for oil will decline by about 6-8% in 1998, which will cut product imports (largely middle distillates) in half, compared with the 1997 level.
- Economically sound policies dictate that reforms must continue in order to attract much-needed foreign investment. This will include continued deregulation of the petroleum industry, especially the downstream oil sector. The government announced that it recently submitted a draft of a new law concerning the opening of downstream operations to increase competition in the provision of petroleum products, including retailing for new refiners.
- Under the new arrangements, each of Pertamina's refineries would be a separate profit center, thus making it possible to form a joint venture for each refinery. It is quite clear that Pertamina will not be able to undertake any expansion programs without infusion of foreign capital from potential partners.
- One obstacle to opening the domestic market is price regulation. The government has announced its intention to remove the subsidy, but it will face fierce opposition from a more powerful parliament and other pressure (special-interest) groups. Indeed, in the longer term, Indonesia needs to move to market prices; but it is hard to see how

this can be accomplished with the currency's value so depressed.

- Pertamina is striving to become more independent and professional, but the changing rules and regulations will be a challenge in this regard. Cash-strapped Pertamina may not be able to maintain enough momentum to prove that it is able to compete in the upstream sector. (Pertamina's E&P accounts for a mere 5 percent of Indonesia's total crude oil production.) Nevertheless, Pertamina may become more aggressive in wishing to take over expired contracts.

THAILAND AND SOUTH KOREA

Thailand and South Korea shared the symptoms of the crisis: What began as a speculative attack on the local currency revealed the weak fundamentals in the economy, i.e., the financial sector, which resulted from imprudent rapid expansion of debt financing. Both countries are now paying the price with economic contraction in 1998.

In overcoming the crisis, Thailand and Korea are on the right track, but the role of the IMF and other international financial institutions is crucial to their recovery. These countries need to solve their debt problems and restore confidence in their financial markets. Economic recovery for Korea and Thailand is expected around 2000.

Impact on the Thai and Korean Oil Sector:

- Thailand's oil sector was completely deregulated in 1994, whereas Korea was in a state of transition when the crisis hit. Deregulation in Korea is now officially complete, and "new entry" has been allowed since 1 October 1998.
- As shown in Table 1, lower oil prices in the international market helped dampen the effect of currency depreciation in both countries. Lower crude oil prices have also helped improve the countries' balance of payments.
- The refining facilities that came on stream in Thailand during 1995-1997 slashed diesel imports and provided a sizable surplus of exportable naphtha and gasoline. By the middle of 1997, the refining system was running at high throughput rates. The tumbling demand in late 1997, with sluggish demand persisting up to the present, has made Thailand a net diesel exporter and a net exporter of products overall.
- Overall Thai oil demand in 1997 was 5.8% below the level of the previous year. The current estimate for 1998 is another demand reduction of as much as 8%. Even after the economy rebounds, we foresee that Thai oil demand will not regain its 1997 level until after 2000.
- South Korea has a massive amount of two-way trade of petroleum products. This is partly because many of the planned secondary facilities were not built in pace with the CDU expansion; much product output from the refineries does not meet current Korean specs. Oil demand in 1997 overall was still up by almost 100 kb/d (or 4.3%) over the year before, but it is estimated that demand could tumble by almost 20% this year.
- Most South Korean refiners have continued to run at fairly high throughput rates (Hanwha, which will be acquired by Hyundai, being the exception), but we have recently seen lower runs in Korean refineries. However, refinery runs

(continued on page 6)

Update on Asian Oil (continued from page 5)

have not dropped as much as demand, and exports for the year appear to be up significantly. Preliminary data shows that exports for the first 7 months in 1998 are averaging around 840 kb/d, which is 40% higher than the same period in 1997.

- The situation in Korean refining is volatile; more cutbacks in throughput may be coming, especially since weak refining margins in the international market provide little incentive to export. Given this situation, we may expect refinery utilization to be driven by domestic demand. Apparently, the relatively high domestic product prices have made domestic operations profitable. However, once margins improve in the international market, Korean refiners may run flat-out again and flood the export market, which in turn will cause another deterioration in margins.
- Infusion of foreign capital is perceived as one of the solutions to the economic crisis. In the oil sector, this means increased foreign ownership. Both the South Korean and the Thai governments have been trying to encourage and facilitate through further deregulation measures foreign capital infusion, including relaxing ownership requirements.
- In Thailand, the government through both the national oil company (PTT) and the Ministry of Finance has expressed its intention to sell some of its refinery-ownership shares. PTT is subject to so-called "fast-track" privatization and is required to sell some of its shares in all of its subsidiaries, including some in the joint ventures. However, it is quite clear that the holding company will remain fully under government ownership.
- Indeed, the current economic turmoil has brought about interesting proposals that will likely change refinery ownership in Thailand. The government's shares in Bangchak are for sale, up to a certain level; at least PTT's portion will be divested. There are proposals to swap Shell's and Caltex's shares in Thai Oil with some reductions of PTT's shares (of equal values) in the Rayong Refinery Company (RRC) and Star Petroleum (SPRC), respectively. Thereafter, the plan is to have Thai Oil listed on the stock exchange of Thailand (SET), with up to 15% of its shares available to the public. Unfortunately, heavily indebted Thai Oil and the two refineries (RRC and SPRC) are losing money, making share valuations difficult.
- Further, Exxon has proposed to buy back the 12.5% stake held by the Ministry of Finance to gain complete ownership of the Esso Thai refinery. In the meantime, joint operations and sharing of facilities have taken place among neighboring refineries to reduce operational costs amid mounting losses. RRC and SPRC have decided to integrate the operations of the two refineries. Esso and Thai Oil have engaged in similar arrangements.
- While the current size of Korean refineries would likely have prevented new entrants from penetrating the domestic market, the financial crisis may provide the impetus for the expansion of foreign participation in the oil industry. So far, however, this has not happened. Hanwha, which was up for sale for quite some time and reportedly attracted the attention of some foreign companies, will likely end up being taken by Hyundai although the deal was still not

final as of the writing of this report. Nonetheless, foreign investors may enter the Korean retail market. If they do, they could drastically reduce marketing margins.

- As for refinery investments, many proposals remain on the books for refinery construction or expansion in Thailand, and some of the sponsors claim that their plans for grass-roots facilities are still firm, despite the present financial crisis. Admittedly, in the next decade there will be room for further capacity, but because of the present situation, we are skeptical of all plans for new capacity in Thailand.
- In the great haste to build CDU capacity in Korea in the 1990s, some of the downstream units that would have accompanied them were deferred; it now looks as though it may be some time before these additional units are built (if ever). Although Korean refining now has major cracking and treating facilities, desulfurization capacities still lag behind CDU capacity by a significant margin. This means that not all of Korean refiners' output can meet Korean specs—at least, not without a very judicious and expensive selection and blending of crudes and condensates.

MALAYSIA AND THE PHILIPPINES

Although Malaysia and the Philippines have experienced currency depreciations, their economies are not suffering as badly as Thailand's and South Korea's. However, while the Philippines has maintained more of a business-as-usual attitude, Malaysia has pushed for a fixed-exchange-rate regime to counter speculation. The latter means market intervention that might extensively draw down the country's foreign reserves. Also, it remains to be seen what the impact on potential foreign capital investment into Malaysia might be. Nonetheless, as their currencies stabilize, both countries can start recovering economically. This is likely to happen before the turn of the century.

Impact on the Malaysian and Philippine Oil Sector:

- As a net oil exporting country, lower oil prices contributed negatively to Malaysia's trade balance and to the government's tax receipts. Lower oil prices also mean that revenues from LNG exports decrease, since the LNG price is tied to oil. By contrast, lower oil prices should improve the Philippine trade balance.
- In Malaysia, the combination of currency depreciation and oil-price decrease has left domestic oil prices the same as before under the automatic pricing mechanism, which is monitored by the Ministry of Domestic Trade and Consumer Affairs (MDTCA).
- As for the Philippines, the financial crisis could not have come at a worse time for its oil industry. The loss in purchasing power of the peso put Philippine refiners in the unenviable position of having to raise domestic fuel prices to offset rising crude costs (in local currency), in the face of public protest. Fortunately, sagging oil prices in the international market somewhat dampened the effect of the currency depreciation (see Table 1).
- Amid pressure from public unrest, in November 1997 the Philippine Supreme Court nullified the deregulation law, under which full decontrol had just been implemented in February 1997. After much political posturing and bickering, a new deregulation law—not fundamentally different from the original—was passed by the Philippine congress

and signed by President Ramos in February 1998.

- Malaysian oil demand was set to slow down, even in the absence of an interruption in economic growth, since per capita oil demand was already relatively high. Based on developments to date, oil demand is likely to be "flattish" through 2000, before it recovers, although at a lower rate than that of the early 1990s.
- Philippine oil demand growth was reasonably vigorous but unstable even before the currency crisis. While, the economic slowdown will undoubtedly have a negative effect on oil demand growth in the short run, a massive expansion in natural gas use in the power sector will actually out oil demand (mostly fuel oil, and to a much lesser extent gasoil) in the near future. Although 1997 demand was up by a healthy 8.7%, the economic slowdown will eventually result in a reduction in demand growth. It is estimated that oil demand will decrease by 6% in 1998.
- Malaysia is very active in product trading; in fact, the openness of the market makes the situation somewhat confusing, and no two companies agree on the product balance for a given year. In the past, the total product trade has usually been about balanced, with Malaysia usually long on naphtha and LSWR, but short in gasoline, diesel, and HSO. Recently, imports have overtaken exports, and this situation has persisted in the first half of 1998. With the startup of Melaka II, slated to be on stream soon, this situation will certainly change.
- Refinery expansions in the Philippines in the early to mid-1990s have been sufficient to keep supply generally in line with demand. The Philippines is in a surprisingly good state of balance at present, although there is a strong underlying tendency, common to many neighboring countries, for diesel to move into deficit.
- Although both countries have had some plans for new capacity additions, given the current situation these may likely be postponed or even canceled. These in particular include the grass-roots refineries proposed by new players outside the existing refiners in Malaysia, as well as some expansions by the existing refiners in both countries. An exception to this is the Petronas 50 kb/d condensate splitter in Kerteh, which will be going ahead as planned.
- Competition in the domestic downstream oil markets of both countries is similar: entrenched majors and one state oil company in each. Neither state oil company—Malaysia's Petronas and the Philippines's PNOC, through its subsidiary Petron—necessarily receives special treatment from the government. In fact, Petronas has become a major player internationally, because it has gained experience from fierce competition at home.

SINGAPORE AND TAIWAN

Economic performance has been much better in Singapore and Taiwan than in most other countries in the region during the crisis. Although currency depreciation and stock market fluctuations have occurred in both countries, they are pale in comparison with the plunges in exchange rates and stock markets experienced by their East and Southeast Asian neighbors. Economic efficiency and financial discipline are good explanations for the better performance in Singapore and Taiwan.

Indeed, while many now point to the failures of "the

Asian way," Singapore and Taiwan exemplify that prudence is inherently required in governance and business dealings, especially in avoiding potential collusive practices.

Impact on the Singapore and Taiwan Oil Sector:

- Singapore's oil market, where majors have been entrenched for decades, is more characterized by its role in catering to the import requirements of other Asian countries. While Taiwan's oil industry is in the beginning of gradually eliminating a monopoly (held by the state oil company, CPC), Singapore has always been an "open" market.
- Singapore is naturally a major exporter, whereas Taiwan has been a net importer (albeit relatively small) of products. While significant expansion in Singapore is unlikely because of the limited availability of sites, Taiwan's domestic oil market will soon have a new player—Formosa Plastics Corporation, which will bring a significant capacity addition. As a result Taiwan, will soon become an important net exporter. More importantly, owing to its demand slate, Taiwan will have a significant exportable surplus of middle distillates for many years to come.
- The slowing economic growth in both countries will bring about a stagnation of oil demand; Singapore's is likely to be flattish until the year 2000, whereas Taiwan's will actually decline in 1998 (by about 15-20 kb/d) before rebounding somewhat in 2000.
- Although Singapore's refiners respond rapidly to take advantage of whatever opportunities arise, in recent years Singapore has become an overall constant factor in the market. The only new feature in the last few years has been a shrinkage in net naphtha exports, as a result of Singapore's increasing petrochemical naphtha demand (and increased blending of gasoline). Nonetheless, Singapore is capable of consistently exporting important products—most notably middle distillates (in the range of 450-500 kb/d).
- Singapore exported as much as 1.1 million b/d of products in 1997. Currently, product exports are down to about 850 kb/d because of a reduction in refinery runs—as low as 60% in August 1998—due to weak refining margins. Singapore is capable of maintaining exports of some 1 million b/d until 2005, although weak margins may cause less refinery runs, hence lower product exports.

JAPAN

The world's second largest economy is struggling with severe problems. Indeed, Japan does not really belong on the list of "crisis countries" except for the fact that its problems are tied to the others and are due to mutual banking difficulties. Japan has experienced not an economic "plunge" but a long period of relative economic stagnation, which is not a strange thing in a mature economy.

Also, the Japanese currency has not collapsed; it has sagged quite a bit—the currency is worth less than the unrealistic levels seen in 1994/95 but still almost twice as much as in 1985. Although Japan will not deepen the Asian economic crisis, it certainly cannot help much at this moment.

Impact on the Japanese Oil Sector:

- While low oil prices help lower Japan's oil (and ING)

(continued on page 8)

Update on Asian Oil (continued from page 7)

import bills, it is the deregulation process that has plagued the Japanese oil industry.

- Japan's long-protected oil refining and distribution industry has been in sad financial shape for many years; deregulation and the consequent drop in gasoline prices put many refiners into the red. The general financial crisis is likely to result in a number of refinery bankruptcies and mergers.
- Japan is by far the largest refiner in the region, with a capacity of nearly 5 million b/d. Japan is also one of the highest-cost refiners in the world, and one of the largest product importers. Japan's imports are, however, dominated by LPG and naphtha rather than traditional "spec" products.
- As a mature economy, radical change in energy demand should not be expected. Fluctuation of oil demand from year to year is caused more by the severity of the climate, such as winter heating needs and summer hydro availability. The most likely outlook as a result of economic stagnation is some minor contractions in gasoil and a dip in naphtha use. Demand in 1998 is expected to decline by some 125 kb/d but will slightly rebound in 2000.
- Full deregulation of the Japanese oil market has caused a severe depression in the refining industry (which already faced high debt and low profitability). This situation particularly hampers the many relatively smaller refineries. We are expecting refinery closures totaling some 350 kb/d net.
- So far in 1998, Japanese refineries have kept their throughput surprisingly high; but many existing refiners are beginning to look toward rationalization and increased imports of products.
- The full deregulation of the Japanese oil market may actually give incentives to new (foreign) players to enter the retail market, since imports by non-refiners may have a competitive advantage (compared with having a refinery to worry about).

CHINA AND INDIA

Financially, India and China can be described as "partially open" countries at best. Because their currencies are not internationally convertible, India and China are less affected by the currency crisis. These two countries have their own problems to worry about, and their economic growth may be lower than expected. But neither is likely to experience an economic collapse over the next three to five years.

The regional financial crisis, however, could cause the trade balances to deteriorate in these two countries—China's in particular. Despite some economic pressure to devalue, China has maintained the value of its currency, and therefore will be less competitive in exporting manufactured goods.

Although India is not in a financial crisis, it still faces its ongoing capital constraints. Obviously, the recent nuclear incidents diminished the chances of attracting more foreign capital. While sanctions resulting from the nuclear tests may make little difference, the incidents have made investors more wary of putting their money into the economy.

Impact on the Chinese and Indian Oil Sector:

- While both countries still employ price regulations, domestic oil prices in India are very different from those in China. Indian prices have always been characterized by heavy subsidies. By contrast, China was setting its domestic oil prices much higher than the international market level, until recently, but has now brought its prices into line with the international market.
- China's oil demand grew rapidly in both 1996 and 1997, with respective increases of 7.2% and 9.2%. However, we estimate that demand growth in 1998 will slow down to about 4%, partly owing to the spillover effects of the Asian crisis.
- India's oil demand remains strong. Demand in 1996 was up almost 9% from the previous year, but 1997 growth was up "only" 5% over 1996. This is, however, likely to be more a result of the price reform process that was initiated in 1997 than a consequence of Asia's economic woes. In any case, to date, 1998 appears to be showing a significant rebound: the year as a whole is currently projected to register 7-8% growth over 1997 levels of demand.
- China and India are the two major importers that are coming to dominate the Asia-Pacific market, though in terms of sheer volume, Japan is larger than either. China remains heavily deficit in all products other than gasoline. Even this is deceptive; there is every reason to believe that most of China's net gasoline exports could easily be absorbed domestically, if the product were made available in the centers of demand. Indeed, geography plays a major role in the trade patterns of the country, as does the desire to capture foreign exchange. Moreover, despite rapid demand growth rates in the recent past, brought about by brisk economic performance, China's oil demand per capita is still relatively very low.
- Although China's demand will remain vigorous, and imports will still be subject to various interventions, the reforms to follow international market prices should help China move in sync with the region. Nonetheless, despite a major refinery-building campaign, imports will continue to rise steadily.
- India's imports are more slanted toward middle distillates, which usually account for 80-85% of India's product imports, as opposed to 30-40% of China's. Despite slowing demand growth in India, imports will continue to mount, owing to the lagging refinery capacity expansion.
- Refinery construction plans in India have always been over-ambitious and continue to lag behind their announced schedules. However, recent developments indicate that a massive addition of refining capacity will actually materialize within a few years. It is expected that, by 2000, India will add as much as 720 kb/d of refining capacity to the current level. Reliance, an Indian private company, will have the largest (360 kb/d) new capacity, whereas the rest are expansions and new plants owned (wholly, partly, or in joint ventures) by the state oil companies.
- There are other projects still on the books for India, mostly involving potential foreign partners. It remains to be seen whether lower oil prices will hurt India's chances for refinery joint ventures involving potential Middle Eastern countries such as Kuwait, Oman, and Saudi Arabia. These

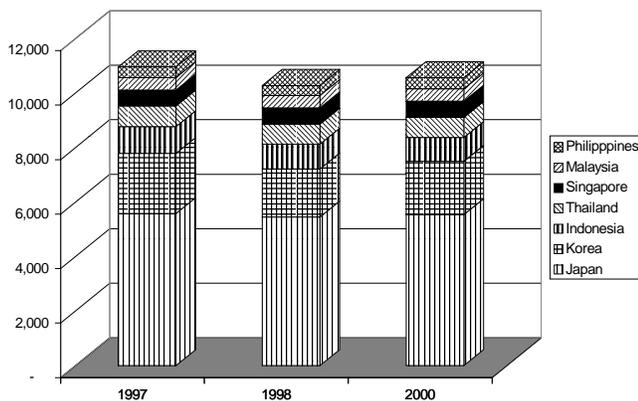
countries are feeling less wealthy at low oil prices and may be indirectly deterred by the U.S. sanctions.

- The moves by the majors and other foreign independent oil companies to China and India so far are primarily directed toward "smaller" but more feasible investments such as LPG terminals and lube blending, rather than taking part in the construction of grass-roots refineries. (Total is an exception, with its involvement in the Dalian refinery in China.) These investments will, to a certain extent, secure some exposure and presence in the market.

Regional Picture

- The Asian financial crisis has deepened beyond the initial predictions of most economists. It does have a negative impact on oil demand, especially 1998 demand, which is predicted to be 300-350 kb/d less than the previous year. However, the regional oil demand would have been even lower, had oil prices not declined.
- It is apparent that lower oil demand will materialize in the countries experiencing economic crisis (see Figure 1). In 1998, the six crisis-affected countries—Indonesia, Thailand, South Korea, Malaysia, the Philippines, and Singapore—plus Japan will collectively contribute as much as 680 kb/d to the drop in regional oil demand. As Figure 1 shows, some of the lost oil demand growth will be recaptured by 2000.

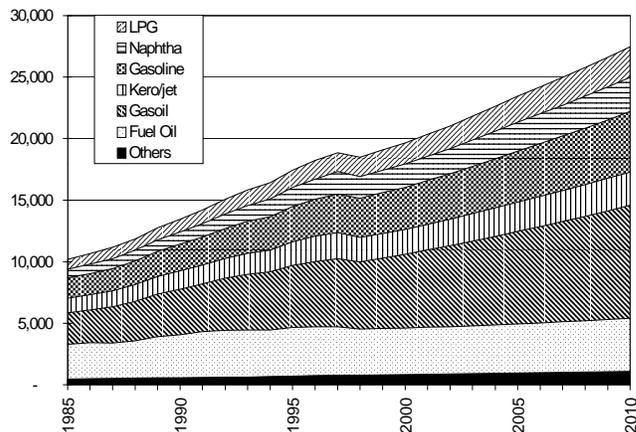
Figure 1. Oil Demand in Crisis-Affected Countries (kb/d)



- Although some of the crisis countries will see further reductions in oil demand next year, the region as a whole is likely to resume positive growth in 1999, and by 2000 there will be a new peak. Even with the 1998-1999 slump, growth should average nearly 2% annually over the period 1996-2000. With the recoveries of the crisis countries, demand growth should again increase in the first half of the next decade, and our best-case projection points to 3.5% per annum. Figure 2 shows Asia-Pacific region oil demand by product, representing our best-case forecast for the future. As the figure shows, there will be an interruption in the region's demand growth for 1.5 to 2 years before growth resumes.
- The drop in oil demand in the Asia-Pacific region will profoundly affect the product market, especially since capacity expansions in recent years were carried out under the assumption of steady demand growth.
- The net product deficit in Asia will be smaller than

anticipated, thus lessening product imports from the Middle East. Exportable volumes from the Middle East are higher than ever, but Asian imports have sunk to a low level not seen for many years. Consequently, plenty of Mid-East products will be flowing to the Mediterranean and the Atlantic Basin.

Figure 2. Asia-Pacific Oil Demand by Product, 1985-2010 (kb/d)



- In the end, refining margins will dictate product supplies and allocations. When margins turn sour, refiners will slash crude runs. This is especially true for countries with product surpluses.
- Although the Asia-Pacific region has several important oil producers, the region's oil demand dwarfs its oil output. Today, demand is around 19 million b/d, but production is only about 7.5 million b/d. We believe there will be no drastic change in regional crude production; it may go up for a while and then either reach a plateau or decline.

Table 2
Asia-Pacific Oil Import Dependence
(million barrels per day)

	1996	1997	1998	2000	2002	2005
Oil Demand ¹	18.6	19.3	18.7	19.8	21.2	23.6
Oil Production ²	7.4	7.6	7.8	8.3	8.3	8.0
Net Imports	11.2	11.7	11.0	11.5	12.9	15.6
Oil Dependence	60%	61%	58%	58%	61%	66%

¹ Crude runs plus direct crude use plus net product imports.

² Crude (including condensate) output plus nonrefinery LPG.

- The combined effect of the slump in demand plus continued increases in Asia-Pacific crude, condensate, and gas-based LPG production is quite remarkable. Lower demand plus higher output plus spare refining capacity will push the region's oil import dependence down (see Table 2).
- As shown in Table 2, the region's oil import dependence was as high as 61% in 1997, but given the current situation, dependence is expected to fall to 58% in the years between 1998 and 2000. However, the projected rebound in oil demand growth after 2000 will, unfortunately, reverse this temporary trend.

Energy Market Liberalization in Central and Eastern Europe

In Conjunction with the Faculty of Electrical Engineering
Czech Technical University
Prague, Czech Republic
September 6 to 8, 1999

This Conference will focus on:

- Energy Market liberalization and Entry of New Countries into the EU
- Cogeneration in the new century
- Technical progress and sustainable growth in the energy sector
- Government Policy: Experiences with liberalization and deregulation directions of the EU

Highlights of the Conference will include:

- Central and Eastern Europe: energy markets perspectives
- Deregulation and privatisation in Europe
- Regulatory processes in the district heat, gas and electricity sectors
- The role of technologies and advanced systems to sustain energy development
- Long-term scenarios for development of liberalised energy markets in Europe
- The role of environmental policy for development of energy markets
- The role of energy policy
- The role of corporate strategies
- The role of taxation
- Emergence of decentralised systems
- Development conditions for cogeneration systems
- Criteria for upgrading local energies
- Development market condition for renewable energies
- World energy after Kyoto
- The role of technology on energy cost reduction

Contributions will be in lecture format and English will be the official language.

To register and obtain information:

For online registration use <ftp://aldebaran.feld.cvut.cz/pub/cem1999>

Download registration form from: <ftp://aldebaran.feld.cvut.cz/pub/cem1999>, fill it in and return to pichal@feld.cvut.cz

If you are unable to use ftp, send a request for a registration form to pichal@feld.cvut.cz An electronic version will be sent to you. Complete it and send it back to: pichal@feld.cvut.cz

Should you need a paper registration form, please write to CEM, c/o Jan Pichal, FEL CVUT, K302, Technická 2, 16627 Prague 6, Czech Republic. Your Personal Identification Number (PIN) will be printed on the form.

The First Annual Award of IAEE Student Scholarships

The Council of the IAEE awarded its first student scholarships on 1 April. There were five successful applicants each of whom receives US\$2,000 to support their studies of energy economics. They also receive five years' membership of the IAEE and free attendance at an IAEE sponsored international energy conference.

The five winners are:

- Sarath Delpachita from Sri Lanka who is studying for a PhD at the Department of Economics & Resource Management University of S. Queensland, Australia.
- Amimer Djamila from Algeria who is studying for a PhD at the Centre for Energy, Petroleum and Mineral Law and Policy at the University of Dundee, Scotland, UK.
- Raul A Gonzalez Olmedo from Venezuela who is studying Economics and Energy Policy at the University of Oklahoma, USA.
- Prasad Rao from India who is studying for a PhD at the Department of Energy, Environmental & Mineral Economics at Penn State University, USA.
- Tanja Rukavina of Croatia who is studying for a Masters Degree at the Zagreb Energy Institute, Croatia.

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. We hope to award further scholarships next year and will advertise the scheme in future editions of the *IAEE Newsletter*.

The Council of the IAEE has been anxious to use a portion of the funds of the association to actively promote the studying of energy economics. We fully appreciate the financial constraints that many students are facing and wished to make some contribution to the development of the world's leading energy economists for the next century.

The awards Committee comprised Prof. Peter Davies (BP Amoco, London) - President-elect of the IAEE, Dr Michelle Michot Foss (University of Houston) - IAEE Vice President for Conferences and Prof. Jean-Philippe Queille (IFP School, Paris) - IAEE Appointed Council Member 1998.

Editor's Note (continued from page 1)

tant to give up day-to-day control of the industry and this has seriously undermined confidence in reform. Restoring confidence will require major changes in government policy.

Fereidoon "Perry" Sioshansi reports on California's electricity restructuring in two back-to-back articles that explain how the Competition Transition Charge and the Trust Transfer Amount work and how (and when?) the state's public utilities will recover their stranded costs through the Competition Transition Charge.

Miroslav Pichal and Ivan Benes report the Czech view of energy liberalization.

Readers are reminded that the *Newsletter* is constantly on the look out for material from IAEE members.

D L W



1999 EUROPEAN CONFERENCE OF ENERGY ECONOMICS
- TECHNOLOGICAL PROGRESS AND THE ENERGY CHALLENGES -

Paris, 30 september - 1 october 1999

The energy sector is the field of rapid technological progress under the effect of the competitive strategies of companies and technological policies. Technological forces allow changes in institutions and industrial organisation, and stimulate the development of competition. Technology can also make a difference on long-term energy challenges: foreign oil dependence, resources exhaustion, environmental protection, risk of climate change.

The conference aims at providing an opportunity to look back on the economic, industrial and environmental effects of the technological development of the last twenty-five years and assess the respective efficiency of the private innovation strategies and public policies. This past experience can give indications on the future direction of the technical change, its elements of dynamics and the possibilities to act on it to face the critical energy and environmental issues that will affect us in the next century.

Co-Chairmen of the Conference

Georges BOUCHARD
(Gaz de France)

Denis BABUSIAUX
(Institut Français du Pétrole),

Members of the Scientific Committee

Ezio ANDRETA - Science, Research and development - Director
Energies - European Commission - Belgium
John CHESSHIRE - University of Sussex - UK
Edgardo CURCIO - Italian Association for Energy Economics - Italy
Wilfried CZERNIE - Ruhrgas - Germany
Georges DUPONT-ROC - Shell - UK
Dominique FINON - Chairman of the Scientific Committee - France

Arnulph GRUELER - International Institute for Applied Systems
Analysis - Austria
Jean-Eudes MONCOMBLE - Electricité de France - France
Gérard SARLOS - Ecole Polytechnique de Lausanne - Switzerland
Yves SMEERS - Université Catholique de Louvain - Belgium
Antonio SORIA - Institute for Prospective Technological Studies - Spain,
Fritz VAN OOSTVOORN - Netherlands Energy Research Foundation -
The Netherlands

THEMES OF THE CONFERENCE

Driving factors and constraints on technical progress in the energy sector:

- Relationship between energy and growth,
- Role of the cultural and political environment (environmental constraints, geopolitics, etc.),
- Role of energy, R & D and fiscal policies,
- Role of corporate strategies and industrial structures,
- Role of cross-fertilization and spillovers from equipment industries.

Technical progress and changing structures of energy industries and markets:

- Emergence of decentralised systems (economies and externalities),
- Impact of new information and production technology,
- Competition and innovation strategies in the production processes,
- Changes in the supply induced by innovation and competition : from the energy commodities to the energy service.

Technical progress at the service of sustainable growth:

- Technological innovation as an answer to the climate change issue,
- Incentives and barriers to technical progress in enhancement of energy supply resources,
- Development conditions for renewable energies and efficient technologies,
- Scope for technology transfer (e.g., by joint implementation, tradable permits, etc.)
- Liberalised markets: what incentive for long term R & D for sustainable development ?

Technological progress, energy modelling and prospects:

- Advances in the integration of technological progress in different types of modelling (sectorial, macroeconomic; bottom-up versus top-down; etc.),
- Integration of technical progress in long term scenarios and forecasting,
- Methods for the analysis of efficiency of market-based instruments and R & D policies.

English and French will be the languages of the conference with simultaneous translations for plenary sessions, and English the language for other sessions.

All inquiries should be directed to :

Dominique FINON, Programme Chairman of the Scientific Committee

Institut d'Economie et de Politique de l'Energie - B.P. 47 38040 GRENOBLE CEDEX 09 - FRANCE
finon@iepe.upmf-grenoble.fr

Energy Sector Reform in the Ukraine

By Iaszlo Lovei*

Summary

Many countries in the world are struggling to liberalize their energy markets and to replace rigid state controls by private initiative and ownership. The case of Ukraine illustrates the extreme difficulties of this transformation in a country suffering from macroeconomic imbalances, poor enterprise governance, and ineffective political leadership—a combination of factors present in several countries of the Former Soviet Union (FSU) today. Although the reform of the energy sector in Ukraine is still far from being complete, this note, together with another two on gas and coal, describe the process Ukraine's energy sector has gone through since independence, with particular emphasis on the interplay between economic and political factors.

The First Three Years

Ukraine became independent in late 1991. The new state consumed 229 million tons of oil equivalent of primary energy in that year, more than most countries in Europe on a per capita basis. Half of Ukraine's energy demand was supplied from Russia at prices that were a small fraction of world market prices. In early 1992, the Russian government announced that the price of fuels exported to the "near abroad" would be gradually increased to world market levels (within a year for oil, and within two years for gas), giving little time for Ukraine to prepare for the coming terms of trade shock.

Following an intense lobbying effort by domestic energy producers, the Ukrainian government decided that the best defense was the substitution of imported oil and gas with a combination of domestic fuels (mostly coal) and energy saving measures. The government also decided that increases in the price of imported fuels would be reflected in domestic energy prices with a lag in order to provide time for industrial and residential consumers to adjust. The budget was left as the only source of funding for the necessary investments in domestic coal production and energy conservation.

In the next three years, the budget deficit reached 10% of GDP, the energy intensity of the economy increased by 10%, coal production decreased by 30%, and the value of unpaid energy imports surpassed \$5 billion. The energy utilities—electricity, gas and district heating networks—could not cover their operating costs, and service quality rapidly deteriorated. The leadership of the electricity industry was the first to respond to the wake-up call.

The Electricity Industry in 1991-94

Ukraine inherited a highly developed electricity industry from the Soviet Union. With a generation capacity of 52,000 MW (65% thermal, 25% nuclear, and 10% hydro), 18,000 km of high and 50,000 km of low voltage lines, the power industry provided 296 TWh of electricity in 1991, including 28 TWh for customers outside the FSU. The non-nuclear part

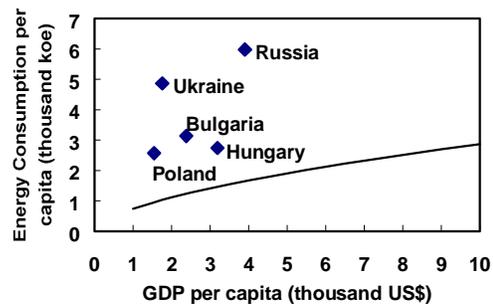
*Iaszlo Lovei is a Lead Specialist in the Energy Sector Unit, Europe and Central Asia Region of the World Bank. The analyses and recommendations in this paper reflect the personal views of the author, and have not been endorsed by the management of the World Bank.

See footnotes at end of text.

of the power industry was organized into seven vertically integrated regional monopolies under the Ministry of Power and Electrification (Minenergo). The five nuclear power plants were under a separate state committee (Goskomatom).

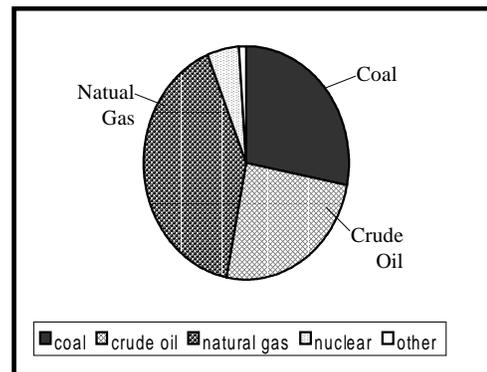
Despite a growing surplus of (nameplate) generation capacity due to decreasing domestic demand, a sizeable backlog of investments started to accumulate in the first years of independence: (i) Ukraine's Western partners demanded safety upgrades for nuclear plants; (ii) aging thermal and hydropower plants badly needed rehabilitation; and (iii) automatic controls and flexible peaking capacity had to be installed so the quality of electricity supply (stability and security) could improve.

Ukraine: Composition of Primary Energy Consumption versus GDP (1990)¹



Source: World Development Report (1992)

Ukraine Energy Consumption (1990)



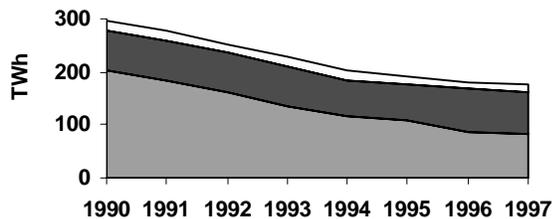
Origin of the Reform Concept

The leadership of Minenergo actively studied electricity reforms in other parts of the world. They were particularly impressed by the reform that took place in the United Kingdom in 1989-90. First, they noted the similarity of the size and the generation mix of the two power systems. Second, they liked the comprehensiveness of the UK reform: the establishment of specialized generation companies which compete to sell electricity through a competitive pooling arrangement; the introduction of a license-based regulatory system; and privatization. Third, they had a strong desire to restore Ukraine's place as a leading force in the power industry in Eastern Europe², and felt that the adoption of the UK model would place Ukraine in the forefront again.

Minenergo also became increasingly convinced that the current structure and governance of the Ukrainian power industry was an impediment to modernization. The price of electricity needed to be de-politicized, but this was unlikely

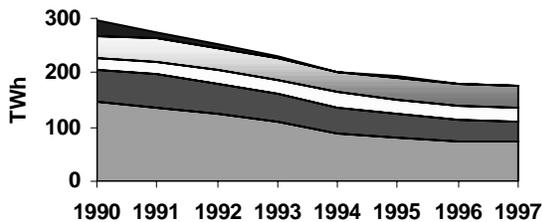
to happen without an autonomous, transparent, rule-based regulatory system and a high degree of competition among generators and suppliers. The industry needed know-how and investment that the current owner (the state) could not provide, but the privatization of regional monopolies seemed politically unacceptable in a fragile new state which was pulled in various directions by the regions.

Electricity Generation



■ Thermal ■ Nuclear □ Hydro and Other

Electricity Consumption



■ Industry ■ Other Sectors □ Households
 □ Losses ■ Net Exports

The New Industry Structure

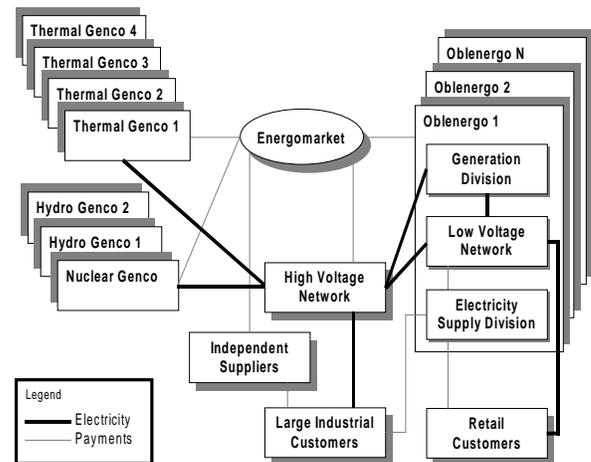
In May 1994, the President of Ukraine issued a decree "On the Market Transformation of the Power Sector of Ukraine" which stipulated the unbundling of the power sector and the development of a competitive national wholesale market for electricity. The restructuring of the sector took place in 1995-1996, supported by extensive technical assistance from a large number of multi- and bilateral donors. This international assistance program was coordinated by Minenergo³ and the World Bank. As a result of restructuring, today Ukraine's power sector is organized as follows:

- The 14 largest thermal power plants are owned and operated by four joint stock generation companies. Two joint stock companies own and operate the eight hydropower stations on the Dnieper river and the three hydropower stations on the Dniester river. A nuclear generation company—Energoatom—owns and operates Ukraine's five nuclear plants. The state owns the majority of the shares of the thermal generators, and 100% of the shares of the hydropower and nuclear companies.
- Twenty seven joint stock companies (oblenergos) own and operate the low-voltage networks and some generation capacity (mostly CHP plants) in the 25 oblasts and two city administrations (Kiev and Sevastopol). The majority of the shares of most of the oblenergos is state owned. The

oblenergos as regulated tariff suppliers have an obligation to serve all customers wishing to buy electricity at the regulated retail price.

- Several licensed non-regulated tariff suppliers purchase electricity from the wholesale market and re-sell it to large consumers. By late 1997, the share of electricity sold by these privately owned suppliers reached 20%.
- Ukrenergo, a state company, owns and operates the high-voltage network (220 kV and above) and the National Dispatch Center (NDC). NDC's main functions include: (i) the control and financing of the high voltage grid; (ii) the purchase of all electricity from generators (except industrial self-generators) and re-sale of this electricity to regulated and non-regulated tariff suppliers; (iii) the dispatch of power generators; and (iv) the purchase of ancillary system services.

Ukraine Electricity Industry Structure



Technical and financial market operations are governed by a set of Market Rules described in the Energomarket Members Agreement (EMA) signed by the generators, suppliers and Ukrenergo. The price of electricity purchased from thermal power plants and their dispatch is determined on the basis of hourly bids. A National Electricity Regulatory Commission (NERC) was established in 1995. NERC issues and monitors licenses for electricity generation, high voltage transmission, low voltage distribution, wholesale market operation, and tariff and non-tariff supply. The licenses stipulate the methodology to calculate high and low voltage network fees, NDC's margin, and retail tariffs applied by oblenergos. The average retail price of electricity was tripled (in US\$ terms) between 1994 and 1996, eventually reaching \$39/MWh, a level that was close to the economic cost.

By mid-1997, the reform laid down the foundation for competition in electricity generation as well as in electricity supply. The wholesale market had a functioning governance structure and a demonstrated capacity to evaluate hourly bids, implement dispatch accordingly, determine financial claims and obligations, and implement the financial transactions needed to settle these claims among market members. Access to the high and low voltage networks was regulated by an entity (NERC) independent from the power companies as well as government ministries. The regulator made a commit-

(continued on page 14)

Energy Reform in the Ukraine (continued from page 13)

ment to allow the full pass-through of justifiable costs (including the market-determined wholesale price) to retail tariffs. The new industry structure and the basic operating principles received the approval of the Parliament in October 1997, when a new Law on Electricity was passed. In spite of these remarkable achievements, the main promises of the reform—de-politicization of electricity price setting and attraction of investment and know-how to the power industry—have remained unfulfilled so far. The reasons for this disappointing result are described below.

Half-Hearted Stabilization

The tripling of the electricity price in Ukraine in the 1994–96 period coincided with macroeconomic stabilization and the introduction of a new currency, the hryvnia. Macroeconomic stabilization included the application of rigid controls over the cash deficit of the state budget, the elimination of directed credit, and a tight monetary policy leading to very high interest rates on domestic loans. These factors, coupled with the generally poor status of most industrial enterprises and an inadequate social safety net, led to rapidly growing payment arrears and the barterization of the economy. Energy suppliers—electricity, gas and district heating companies—were particularly severely affected. Their best self-defense mechanism, reducing or cutting off deliveries to delinquent customers, was considerably weakened by pressure from central and local government officials to protect important constituencies (e.g., municipal services, budgetary organizations, agriculture cooperatives, coal mines, and industrial enterprises of “strategic” importance). By determining which individuals and enterprises should be allowed to consume energy without a corresponding payment, the government was able to cushion selectively the impact of tight monetary and fiscal policies on enterprises, workers, and the population at large. In essence, *the government decided to use the energy sector as a substitute for the social safety net as well as an instrument of industrial and agricultural policy.* This slowed structural adjustment down, delaying the supply response and ultimately undermining the whole stabilization effort.

Political Interference in Market Operations

According to the Market Rules, oblenergos who have not paid fully for the electricity purchased from the wholesale market should be penalized by the curtailment of future electricity deliveries. NDC, the operator of the wholesale market, was presented with a choice between following the Market Rules, or obeying instructions from Minenergo. The latter opposed the curtailment of deliveries to oblenergos, and tried to address the problem through reaching agreements with central and local government officials on lists of customers who could be disconnected without political repercussions. Since Minenergo represented NDC’s owner, the state, the choice for NDC’s management between these two options was clear—there was no curtailment directed at delinquent oblenergos.⁴ The governing body of the wholesale market did not raise objections to NDC’s non-compliance with Market Rules because its members were also under Minenergo control. In theory, the regulator could have intervened as the last line of “defense”, however, NERC was still strongly under the influence of the government (see

below).

In a parallel development, the government became concerned about the impact of electricity price increases on the rest of the economy. At the end of 1996, NERC was instructed (informally) by the Cabinet to leave retail prices unchanged until further notice. Minenergo was ambivalent about the indefinite postponement of the planned price increase. On the one hand, Minenergo recognized that the existing average retail price could not fully cover generation, transmission and distribution costs. On the other hand, the higher retail prices would have increased the tax obligations of the sector while the increase in actual revenues would have been negligible as long as oblenergos were not permitted to disconnect non-payers. NERC knew well that it could not keep retail prices unchanged without control over the wholesale market price. Accordingly, it instructed NDC to apply (ex post) downward corrections to the daily average system marginal price in contradiction with the applicable Market Rules.⁵

The proliferation of barters and various other non-cash payment modes (mutual cancellation of payment obligations, promissory notes, tax write-offs, etc.) further compromised the application of the Market Rules. Since non-cash payments had limited fungibility, only cash payments could be collected and distributed by the wholesale market. This created strong incentives for each individual generator as well as for other market members to maximize barters. Soon, the share of non-cash transactions in the power industry surpassed 80% (the economy-wide average was about 40%). In essence, only the population paid cash for electricity. The problem of perverse incentives that was created by the exemption of barters from the revenue allocation rules⁶ could have been solved by reducing the cash entitlements of market members by the reported value of barters they entered into. Generators and oblenergos, however, were reluctant to disclose fully their non-cash transactions, and constantly lobbied for exceptions to the Market Rules (e.g., generators argued that they needed a minimum amount of cash to pay wages and buy essential spare parts). These demands were accommodated by the Energomarket Board as well as NERC, and the incentives in favor of barters remained in place.

Not surprisingly, the above “adjustments” to the Market Rules—the tolerance of non-payment by oblenergos, regulatory control over the wholesale market price, and the implicit preference given to non-cash payments in the allocation of revenues—proved to be major deterrents for lending institutions and equity investors. The European Bank for Reconstruction and Development (EBRD) cancelled a loan of US\$62 million, and the World Bank suspended the disbursement of a loan of US\$314 million to thermal power companies and NDC. EBRD and the World Bank also slowed down the preparation of new loans intended to finance additional nuclear and peaking hydro capacity. The willingness of strategic investors to purchase stakes in the thermal power companies that the government planned to privatize was weakened considerably.

Lack of a Privatization Strategy

Unbundling and demonopolization of the power industry was expected to be closely followed by privatization. But privatization has proven to be considerably more complicated than restructuring. First, there was disagreement between the

Government and the Parliament about the distribution of responsibilities in the privatization process. Second, the key players—the State Property Fund, Minenergo, Cabinet of Ministers and various Parliament Commissions—could not agree on the method of privatization and on the amount of shares to be kept in state ownership. These disagreements, coupled with a lack of a sense of urgency, resulted in very little progress in 1996–97 (apart from limited sales of shares to workers and managers).

By mid-1997, reformers in the central government and in the power industry recognized that the continued majority state ownership of the electricity companies undermined the autonomy of the Energomarket Board, and major improvements in payment collection were unlikely to happen without the privatization of oblenergos. Only strong, experienced, and independent operators could be expected to resist the political pressure placed on regulated tariff suppliers. The privatization plan adopted by the State Property Fund (SPF) in 1997, however, assigned a high priority to selling minority blocks of oblenergo and generation company shares to financial investors (after satisfying the demands of managers, workers and other holders of privatization certificates). The initial attempts to implement this plan in early 1998 were unsuccessful due to limited investor interest in minority stakes.

Recent Developments

In order to reduce the share of barter, NERC ordered NDC to take into account all barter transactions when allocating cash revenues among market participants in May 1998. Furthermore, as part of the implementation of a comprehensive financial recovery plan for the electricity industry, NERC increased the average retail price of electricity by 22% in May and by 3.5% in June 1998. The tariff increases combined with decreasing oil and gas import prices and reduced electricity demand made the liberalization of the wholesale market price possible by the Fall of 1998. These achievements, however, remain very fragile. A recent law passed by the Parliament, for example, has prohibited increases in utility tariffs for residential consumers until the Budget's wage and pension arrears are eliminated.⁷

New oblenergo privatization tenders issued in mid-1998 offered the right to manage remaining state owned shares for a period of five years to those investors who win the tenders for minority stakes and fulfill other tender conditions such as the injection of working capital to settle overdue payables. Due to deficiencies in the preparation process and the assurances offered to bidders, the tenders again failed to attract strategic investors. Local financial investors, however, acquired majority stakes in seven oblenergos by purchasing shares from workers, at the stock exchange, and through these tenders. There has been no change in the treatment of delinquent consumers and the acceptance of non-cash payments by these oblenergos so far. It remains to be seen whether Ukraine recognizes the need to adopt an approach to privatization that worked well in other countries that managed to sell distribution and generation companies to strategic investors (e.g., Hungary).

Lessons

Although the reform of the electricity industry in Ukraine is just entering its second stage (privatization), the events of the last four years have already generated a number of

important lessons:

- The Ukrainian government and Parliament have been reluctant to give up day-to-day control over the electricity industry. The numerous manifestations of this desire to maintain control-de-facto and de-jure limitations on NERC's authority to set electricity prices, elevating decisions about the disconnection of non-paying customers to the political level, and keeping in state ownership the majority of the shares of electricity enterprises—seriously undermined internal as well as external confidence in the reform. While some of the recently made steps have sent positive signals, restoring the confidence of investors will require major and sustained changes in government policy.
- Contrary to the expectation of some observers, it was relatively easy (with adequate technical assistance) to put in place the basic facilities/systems for a functioning competitive electricity market. Dispatch center, generation and distribution company employees quickly learned to work with the new procedures, and demonstrated remarkable ability to adapt imported solutions to local conditions.
- A centrally managed "gross" pool is a key feature of the power industry model selected by the Ukrainian government in 1994.⁸ In a country that was being pulled in all directions by culturally and politically different regions, the government placed a high premium on the cohesive force that a technically and commercially unified power system was expected to produce. It was felt that a "gross" pool would increase this cohesion. This feature, however, made the treatment of delinquent consumers more susceptible to political interventions by facilitating the spreading of the cost of non-payment evenly across all generators.⁹ Although the establishment of a flexible "net" pool that can accommodate a wide range of direct contracts would have been technically more demanding, this extra effort might have created a more resilient market structure.
- Formal rules are necessary but not sufficient conditions for ensuring the independence of the regulatory body. Due to the lack of a tradition of independent regulation and the high importance attached to short term political benefits, the temptation to intervene in professional decisions is simply too large to resist. Even under the best of circumstances (e.g., legal guarantees, financial autonomy, high quality staff and substantial technical assistance), the ability and willingness of the regulators to balance short and long term interests and the interests of producers and consumers will increase only gradually.
- More generally, historically ingrained attitudes and reflexes are more difficult to change than the written "rules of the game". The re-emergence of old behavioral patterns during political, macroeconomic or sectional crises can threaten the sustainability of gains made earlier. The long time needed to achieve deep and irreversible changes places a high premium on stamina and patience for those supporting sector reforms in the Ukraine (and elsewhere in the FSU).

Footnotes

¹ Ukraine was the only Soviet Republic that had its own

(continued on page 16)

Energy Reform in the Ukraine (continued from page 15)

Ministry of Power. The first large hydropower plant as well as the largest nuclear power plant in the Soviet Union were built in Ukraine. The transmission lines exporting electricity to Central Europe were controlled from Kiev.

² Following its merger with Goskomatom in 1997, Minenergo's responsibilities were extended to the whole power industry. In addition to its policy making function, Minenergo continues to represent the state as the owner of key assets in the sector.

³ The winter curtailment regime followed non-financial criteria, and equally affected paying and non-paying oblenenergoss and customers.

⁴ According to the Market Rules, the system marginal price should be determined by the bid of the most expensive generation unit needed to meet demand.

⁵ Non-cash transactions offered significant tax advantages, since cash received on the bank account of an enterprise was frequently confiscated by the tax service. Furthermore, the reduced transparency of non-cash transactions provided opportunities for personal gains.

⁶ The Deputies were concerned about the planned utility price adjustments in response to a 40% depreciation of the hryvnia against the US dollar in September 1998. President Kuchma asked the Constitutional Court to annul the law in early October. The Court has not reached a decision yet.

⁷ The Ukrainian "gross" pool determines the dispatch of all electricity generators according to their bids (subject to certain constraints). A "net" or residual pool accepts bilateral contracts as a basis for generator dispatch, and the bidding process is applied only to the generation of electricity needed to satisfy demand not covered by these contracts. Furthermore, payments for all electricity delivered to consumers flow through a "gross" pool, while a "net" pool handles payments only for the part of electricity deliveries that are not covered by bilateral contracts between generators and distributors/large consumers.

⁸ Under a "net" or residual pool with an obligation to cover planned energy purchases through direct contracts with generators, those oblenenergoss who continue to provide electricity to non-paying consumers might have had more difficulty obtaining power since individual generators would have been reluctant to enter into bilateral contracts with them.

Future IAEE Events

June 9-12, 1999	22nd IAEE International Conference Rome, Italy <i>Hotel Parco dei Principi</i>
August 29-September 1, 1999	20th Annual USAEE/IAEE North American Conference Orlando, Florida, USA <i>Hilton at Walt Disney World Village</i>
September 20-21, 1999	BIEE Energy Conference St. John's College, Oxford, England
September 30-October 1, 1999	1999 European Conference Paris, France
June 7-10, 2000	23rd IAEE International Conference <i>Sydney Hilton</i> <i>Sydney Australia</i>
2001	24th IAEE International Conference Houston, Texas, USA

The Czech View on the Liberalisation of Energy Sector

By Miroslav Pichal and Ivan Beneš*

For the Czech economy in transition it is very important to liberalise the energy sector in order to decrease the very intensive energy and electricity use in the Czech national economy.

The potential cogeneration utilisation is the most important tool to decrease the intensive electricity use in the next two decades.

To highlight this problem, CityPlan provided balance calculations for different options of electricity and heat supply. The calculation considers nine development options for Czech energy policy. It is supposed to replace about 6000 MWe of installed capacity in the next 30 years. This capacity will replace the Dukovany nuclear plant and the oldest coal plants.

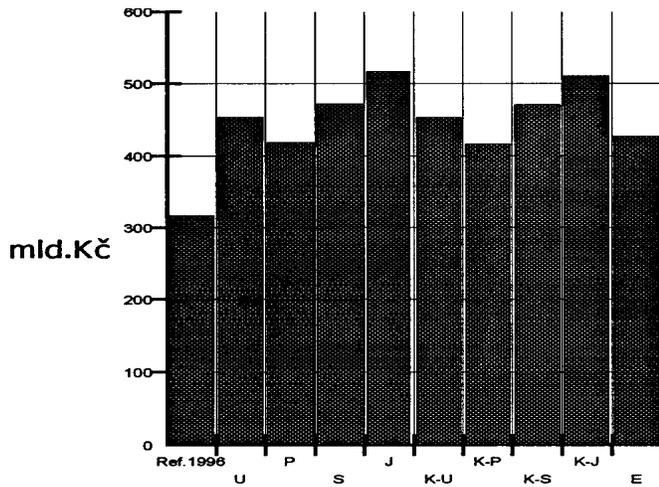
The first scenario is referenced to the year 1996. Three scenarios focus on the high utilisation of coal (U), natural gas (P), or nuclear energy (J). The fourth scenario is a mix of the three primary energy sources. Four additional scenarios (K-U, K-P, K-J and K-S) are similar in primary energy utilisation, but they differ in the higher cogeneration development to the amount of 2000 MWe and more biomass utilisation for space heating. It represents an increase in cogeneration of 35% from the present. The last scenario (E) represents higher utilisation of heat pumps instead of direct electric heating and an increase in the number of solar collectors. This scenario represents a slightly higher investment, but the best benefit for the economy.

In this case study, the same demand for electricity and heat is assumed. That means that we calculated the differences for savings potential on the supply side. Saving potential on the demand side is also important. It helps show economic and environmental benefit from different scenarios more transparently, without dependency on the demand side.

The internal and external costs are calculated. Internal costs are calculated as Long Run Marginal Cost (LRMC) with a discount factor of 10,5%.

The next graph shows the investment cost for all nine

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options:

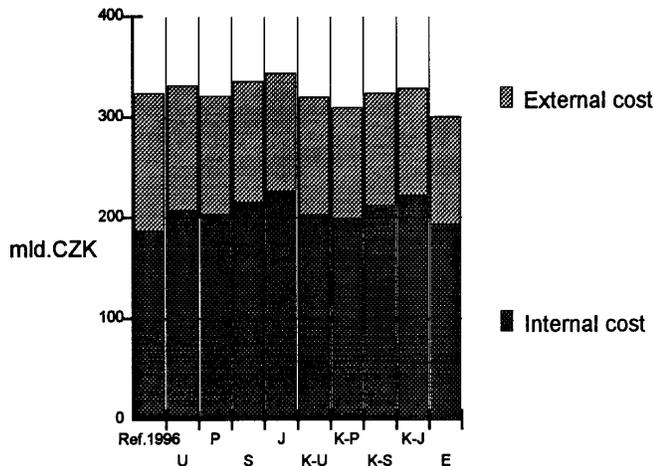
Utilisation of the cogeneration potential can save about 40 TWh/a of primary energy.

Primary energy consumption for electricity and heat:

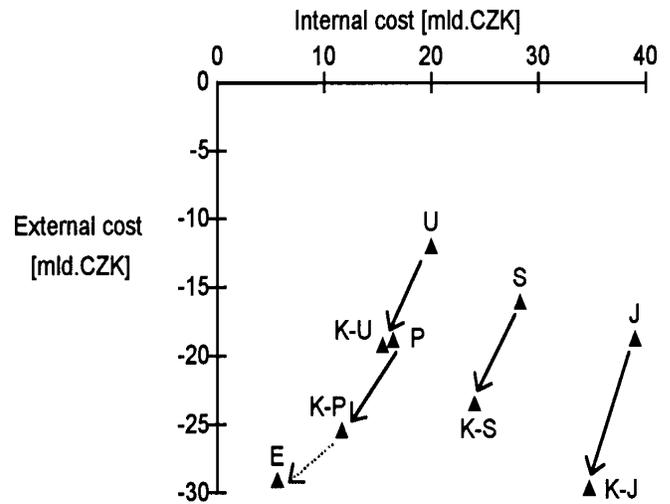
Scenario: Ref.1996	U	P	S	J	K-U
TWh/r	372	342	336	356	368
Scenario: Ref.1996	K-P	K-S	K-J	E	
TWh/r	372	332	353	360	321

The economic benefit of cogeneration options represents approximately 7 billion CZK (200 million EURO) and 12 billion CZK (340 million EURO) of external cost each year.

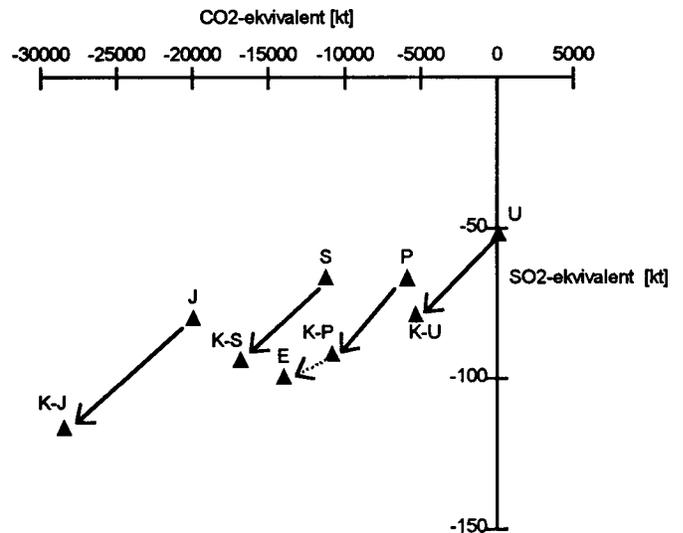
Scenario	Internal Cost	External Cost	Total (mil. CZK)
1 Ref.1996	187900	135800	323800
2 U	207900	123900	331800
3 P	204300	117000	321400
4 S	216200	119800	336000
5 J	226900	117100	344000
6 K-U	203300	116700	320000
7 K-P	199500	110500	310000
8 K-S	212000	112400	324400
9 K-J	222600	106200	328900
10 E	193500	106800	300300



The next graph shows the same figures as a "Trade Off." The arrows show the benefit from cogeneration options.



The impact on the environment follows.



The externalities are based on the German GEMIS database (Öko-Institute Darmstadt):

emissions CO ₂	900 CZK/t
emissions SO ₂	90000 CZK/t
emissions NO _x	72000 CZK/t
emissions of particles	18000 CZK/t
radioactive waste	135000 thous. CZK/t

The results state that for the economic welfare of the Czech Republic it is important to prepare conditions for the utilization of cogeneration potential. It represents more than 2000 MW thermal capacity in heat only boilers.

The Gas Deregulation Process in Europe: Economic and Political Approach

By Jacques Percebois*

Abstract

This paper analyzes the efforts to deregulate the market, to remove the monopolies and introduce competition, both at the European Union level (European Commission) and national levels. The first part of the paper describes the present situation, with an emphasis on the institutional disparities among the European countries. It presents the outlines of the Gas Directive, recently adopted by the European Commission. The second part analyzes the perspectives of such deregulation for Europe. Particular attention is given to the strategies implemented by the oil companies on the market. The third part of the paper consists of the pending questions; the transposition of the Gas Directive into the national laws of the European countries gives rise to several questions which have yet to be answered.

Introduction

Europe may be liberal, but it is more than a simple free trade area. Abolishing customs duties and tariff barriers between signatory countries of the Treaty of Rome (in 1957) was the first stage in building Europe. Customs union was then followed by the free circulation of factors of production within Europe (capital and labour). Economic union is the next stage, and will also involve converging economic, social and monetary policies. Eventually, economic union could also lead to a federation with not just converging, but shared or even single policies.

In fact, the Brussels Commission is forced to admit that certain products and services do not circulate freely within Europe, not for technical reasons but for institutional reasons: the existence of legal monopolies. This is why for almost a decade it has been working towards abolishing these obstacles and introducing real competition, ensuring that European consumers will no longer be victims of discrimination. Several Directives (or European laws) have been adopted: the electricity directive of 19 December 1996 and a draft gas directive on 8 December 1997. This directive will gradually open up the internal natural gas market through increased competition between operators. The first part of this paper presents the institutional framework within which this liberalization process is implemented. We lay emphasis on the main outlines of the gas directive. However, the players' strategies and the relative influence of some of them must not be underestimated. There is thus a risk of collusion, and competition in tomorrow's European gas market will not be genuine and perfect, especially since today's energy strategies are global. The second part of this paper mentions that industrial strategies are taking place in relation to the opening process. A purely competitive structure is not liable to substitute for the present oligopolistic one, contrary to a current opinion. Deregulation is only just beginning, apart from a few exceptions where it is already at an advanced stage

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(such as Britain) and, consequently, numerous questions remain unanswered. In the third part of this paper the present structure of the European gas industry is shown, country by country. The degree of opening of the market varies a lot from one country to another and several uncertainties have to be mentioned concerning the future organization of this industry.

I The Changing Institutional Context: Towards Greater Competition?

The main objective of the European directive is, concerning gas as well as electricity, to bring about more competition and so a higher level of welfare. For understanding this objective it is necessary to remember the context of the European Union.

The Treaty of Rome (1957), which provides the fundamental legal framework of the European Union, does not dispute the notion of "public service" since this is explicitly referred to in clause 90. Nor does it dispute the fact that certain companies should remain in public ownership, since clause 222 allows member states to choose between private and public ownership of their public services. However, the Treaty does dispute the existence of monopolies, which form an obstacle to exchanges within Europe. Competition must reduce the cost of access to energy and guarantee non-discrimination between consumers. But allowance must be made for "natural monopolies," i.e., industries whose returns are increasing because of the existence of an infrastructure with high fixed costs. The Brussels Commission's position is quite clear on this point: the network industries, which are generally public service providers (electricity, gas, water, telephone, public transport), constitute natural monopolies only for the sector of their activity corresponding to infrastructure management. All their other activities must be open to competition. In other words, it would be possible to split the physical activity consisting of transporting and distributing gas (or electricity), which remains a natural monopoly, from commercial activity consisting of selling or buying cubic metres of gas and which could be opened to competition. As far as the production, importing or exporting of gas is concerned, this could not operate as a *de jure* monopoly, because there are no technical limitations at this level justifying the existence of a natural monopoly (such as the cost function sub-additivity). While, for historical reasons, such monopolies do exist, they must be abolished because any monopoly, by its very nature, tends to abuse its dominant position, practice cross subsidies between its various customer sectors, and be subject to bureaucratic operating procedures (overinvestments and excessive costs linked to over-staffing and excessive salaries). Supervision from a higher authority (monopolies commission or ministry) is not sufficient to overcome these drawbacks, especially since the "capture theory" and inconsistencies in the information (informational asymmetries) held by the supervising authority and the utility suggest that these monopolies can influence the regulator and ensure that their own interests are preserved by passing them off as being in the public interest.

Three concepts need to be distinguished. Deregulation is a process whereby certain segments of the industry (exploration-production, sale of gas, etc.) is opened to competition. Deregulation involves the separation, from an accounting (and even legal) standpoint, of exploration-production, im-

porting, transport, and distribution activities between establishments, and even different companies. Privatisation involves opening the capital of the companies concerned to the private sector. The three phenomena can go hand in hand but it is also possible for them not to co-exist. For example, deregulation and deintegration are not always accompanied by privatisation. Conversely (and this was the case in Britain in 1986), privatisation does not necessarily imply deregulation (in this case, a public monopoly is simply replaced by a private monopoly). The Brussels Commission has made deregulation and deintegration compulsory but it cannot impose privatisation because this does not come within its sphere of competence. However, this process of deregulation cannot be analysed independently of the strategy being followed on the international gas scene by the main players involved, viz, oil companies, gas transport-distribution companies and electricity companies.

Therefore, competition must be revived wherever possible (importing, exporting, exploration and production, and gas sales services), and efficient regulation introduced on the activities remaining under a natural monopoly (management of the transmission and distribution network). The Brussels Commission set about this task, and succeeded in passing an electricity deregulation directive (on 19 December 1996) and obtained initial approval of the gas directive of 8 December 1997 (this directive has yet to be adopted by the European Parliament before becoming law in each member state).

As is the case with electricity, the key component of the Gas Directive is the possibility of allowing certain consumers to obtain their gas from the supplier of their choice. This will inevitably lead to the disappearance of the gas importing monopolies (which still prevail in France, for example). "Regulated" or "negotiated" TPA (Third Party Access) is set to be introduced for the wholesale market. It should be noted that, unlike the electricity industry, the gas industry is rarely fully integrated. Gas is generally produced by oil companies and gas companies are then responsible for importing, transport, storage and distribution. Some of them are involved in the early stages of the gas chain (e.g., with a stake in production) but these are in the minority. The gas networks will be opened gradually, in three stages over ten years. This opening-up process will be based on two main parameters :

1. definition of "eligible" consumers: these are all electricity producers who use gas (including cogeneration) as well as industrial customers exceeding a consumption threshold per site. This threshold is set at 25 millions cubic metres (about 20 000 t.o.e.) when the Directive comes into effect (in theory in the year 2000), then at 15 million in 2003 and 5 million in 2006.
2. a minimum percentage of the market opened up: 20% when the Directive comes into effect (2000), 28% in 2003 and 33% in 2006.

The Directive also makes allowance for two other principles: access to the network by third parties and unbundling. Eligible customers will be able to arrange for transport of the gas they have purchased against payment of a toll with toll rates being openly displayed or negotiated with the network managing company (each member State will choose the system that it prefers). A form of TPA is also planned for the upline offshore delivery pipes. Like the electricity Directive, the gas Directive makes provision for the possibility of

constructing direct lines for the exclusive supply of an eligible consumer. However, each of the 15 States of the European Union has a wide margin for manoeuvre to apply these rules by virtue of the so-called "subsidiarity" principle. It should be remembered that the initial situation differs from one country to another in the European Union, as illustrated in the following table. The Directive authorises the States to impose public service obligations (especially security of supply) and allows a gas distribution monopoly to be maintained for those that so desire. Moreover, waivers with respect to TPA are provided for when the security of supply is endangered. A protection system, therefore, exists, the "take or pay" contracts which are long-term supply contracts concluded with foreign exporters.

The narrowness of the gas market explains how the leeway consumers have to find suppliers and producers have to find customers is much less than in the case of oil. The bilateral nature of the relations between gas exporters and importers leads to long-term supply contracts and explains why gas pricing generally is based on negotiated compromises rather than spot prices. Gaz de France officials once said : "an import contract is equivalent to a marriage settled 10 years in advance for a term of 20 years". Today, with the larger part of natural gas in the European energy balance, we may observe a relative harmonization of contract terms but it is not yet possible to speak of a spot market for natural gas in Europe. In Europe all the gas contracts contain constraints on both sellers and buyers, in the form of obligations to supply and to take gas respectively (the level of these TOP constraints is generally very high: 75 to 90% of the amount of the gas sold). The liberalization imposed by the European directive may jeopardize the relationships between the sellers and the buyers, in particular when Third Party Access is explicitly introduced. In the future the gas contracts will probably be negotiated with more flexible clauses between the seller and the buyer.

In the event that an importer should risk having to pay a penalty to his foreign supplier as a result of taking an insufficient quantity of gas after losing some eligible customers (previously supplied by him) this operator could refuse to transport the gas to these customers. However, the Commission intends to ensure strict control at this level.

The consequences of this Directive will differ depending on whether or not the country makes use of large quantities of natural gas for electricity generation. The Directive constitutes a minimum restrictive condition for the States and certain countries have already gone well beyond these conditions. In short, the European countries can be classified into three general categories (see table I) :

1. those in which the gas industry is still relatively integrated and not highly deregulated. Its capital ownership may be predominantly public (France, Italy, Greece, Ireland) or predominantly private (Belgium). Note that the privatisation process is at an advanced stage in Italy (ENI), but no progress in deregulation has been made.
2. those in which the deregulation process has started and where integration is often less marked than in the previous category of countries (Spain, Netherlands, Germany, Austria). A good proportion of the industry has already

(continued on page 20)

European Gas Deregulation (continued from page 19)

been privatised (Spain, Germany).

3 those in which the deregulation, deintegration and privatisation process is at an advanced stage (United Kingdom).

The gas directive project was pending until the adoption, at the end of 1996, of a common point of view among the various European governments about the electricity directive. The consensus was difficult to obtain because of large initial divergences but a compromise solution was at last possible. It is necessary to bear in mind that the European countries have very different positions: some of them are net exporters of natural gas, others import it; in some countries the gas market is already mature, in other ones it is nascent. Some countries use natural gas for most of their electricity generation; other countries do not.

The liberalization expected by the European directive will affect the transmission, distribution and commercialization of natural gas. It does not concern gas production, which remains the job of a small group of oil companies. The European gas oligopoly is composed of GAZPROM (a quasi monopoly in Russia) SONATRACH (a monopoly in Algeria), GDF (an export monopoly in Norway) and GASUNIE (an export quasi monopoly in the Netherlands). (See Table II).

The main stake of the electricity directive is the opening of the electricity production. The main stake of the gas directive is the opening of the transmission and distribution activities of natural gas in Europe. Gas production is already theoretically open in Europe. Practically, that is not exactly the case in all European countries. Another directive, published in 1994, mentions that the natural gas reserves are not

European but national reserves. Upstream the impact of the recent directive will be limited. Downstream it will be greater.

Table II
1996

Natural Gas Production and Consumption in Europe (billion cubic meters)

Country	Production	Consumption
U.K	84.6	85.2
Netherlands	75.8	41.7
Italy	20.2	52.1
Germany	17.4	83.6
France	2.9	32.3
Spain	0	9.3

II. Players's Strategies: A Future Risk of Collusion?

Atomistic competition will not result from this deregulation movement because, hidden beneath this process are industrial strategies often of global significance. The stakes involved include the constitution of industrial groups capable at international level of profiting from the combined action of gas and electricity which would eventually lead to a real oil-electro-gas oligopoly. The main players in ongoing restructuring operations are 1) the anglo-saxon oil companies like Shell and Exxon, but also Gazprom, Sonatrach, Statoil or Elf. 2) gas transport-distribution companies such as Ruhrgas, Gaz de France, Transco, Gasunie, some of which are hesitating between either forming an alliance with the oil companies by investing upline of the gas chain, or entering the electricity production market even if this means competing with the electricity companies which are currently their customers. 3) As far as the electricity companies are concerned, they

Table I
European Gas Industry Structure in 1998

Country	Import or Export	Exploration-production	Transmission	Distribution
FRANCE	Legal monopoly of GDF (100% public owned)	Open (ELF)	Quasi monopoly of GDF (+Elf)	Quasi monopoly of GDF (+ a few local public utilities)
ITALY	SNAM (ENI) (ENI is being privatized)	AGIP (ENI)	SNAM (with limited TPA)	Local utilities (75%) + ITALGAS (SNAM) (25%)
BELGIUM	DISTRAGAZ (TRACTABEL 42%, SHELL 17%, STATE 17% and private 24%. TRACTABEL is controlled by SUEZ-LYONNAISE-EAUX)		DISTRIGAZ	DISTRAGAZ and local utilities (largely controlled by ELECTRABEL, i.e., TRACTABEL)
SPAIN	GAS NATURAL (REPSOL) (private)	REPSOL	ENAGAS (GAS NATURAL) (TPA since 1996)	ENAGAS (50%) GAS NATURAL (40%) others (10%)
NETHERLANDS	GASUNIE (SHELL, EXXON, NAM (Shell, Exxon) and STATE for 50%)	NAM (Shell, Exxon) ELF, CFP-TOTAL	GASUNIE	Largely public Local utilities (120)
GERMANY	RUHRGAS (and WINTERSHALL)	BEB (SHELL, EXXON) MOBIL, WINTERSHALL...	RUHRGAS, BEB, THYSSENGAS (SHELL, EXXON) (limited TPA)	5% local utilities (i.e., STADIWERKE)
UNITED KINGDOM	Open to competition	Open to competition Several oil companies (BP, SHELL, EXXON, CONOCO, TOTAL) and BRITISH GAS (CENTRICA)	BRITISH GAS (TRANSCO) Monopoly with regulated TPA (BG is private)	-open to competition -several distribution firms (among them CENTRICA) -several traders and brokers -TPA largely adopted

have no hesitation, in certain countries (cf. United Kingdom, Italy, Spain, Portugal; even Germany) in planning direct strategic alliances with oil-gas companies, imitating certain major chemical groups (cf. Basf, Montedison) which bypass their usual suppliers (gas transport companies) by obtaining their supplies directly from oil-gas producers. The progressive setting up of TPA will tend to reinforce these alliances because each of the operators knows very well that he must diversify and also acquire a multinational dimension. The deregulation process observed in the United States makes Europe the prime target for restructuring operations. The mergers observed between oil and gas companies or between gas and electricity companies in the United States are just a prelude to the growing list of take-overs within the European gas and electricity industries. These American companies, in fact, occasionally use capital resulting from the recovery of their stranded costs (on their protected home base) to finance the purchase of European companies.

Since the law of 1992 (EPACT), American electricity companies are entitled to expand their growth outside the United States. Thus, seven of the twelve British RECs (Regional Electricity Companies) responsible for electricity distribution, have been purchased by American companies. For example, the Southern Company (American company) took control of Sweb in the south-west of Britain while at the same time acquiring a stake in the German electricity distribution industry (Bewag in Berlin). The American gas company, U.S. Enron, which was a specialist in gas transport, progressively increased its growth in gas sales and subsequently in the independent production of electricity from natural gas and then took over a major American electricity company, Portland General Electric. This electro-gas group now has European ambitions. At the same time, the European oil companies have entered the independent electricity production market using gas, whenever this has proved to be legally possible (thanks to the market being opened up to competition which, in any case, will become the rule in Europe after 19 February 1999). This is the case in Britain where independent electricity production already represents more than 15% of the electricity supply available on the National Grid.

Oil companies are therefore looking for opportunities downstream in the gas industry (gas distribution and trading) and to enter the electricity production business. Electricity companies are themselves looking to forge links with gas companies, especially at the distribution level (benefiting from the gas-electricity synergy). As far as gas transport companies are concerned, it is in their interest to enter the chain further upstream and take a stake in the gas exploration-production business. However, alliances with oil companies are occasionally difficult because the balance of forces is favourable to the oil companies and does not favour the gas companies (cf. British Gas opposite British Petroleum or Gaz de France opposite Elf Aquitaine). The game is complicated by the fact that major chemical industries, often controlled by oil companies, are or will be capable of forging direct links with gas producers (oil companies) by using the transport infrastructure managed by the gas companies (via TPA). These gas companies are, therefore, hesitant about forming alliances with oil-gas companies upstream or with electricity companies downstream (as with Gaz de France opposite Elf

and EDF). It is still too early to say what the European energy scene will look like tomorrow, but gas deregulation, following on from electricity deregulation, will undoubtedly be the catalyst for strategic mergers and alliances. Agreements are possible and national regulators such as the Brussels Commission will have to make sure that competition rules are respected.

III. Pending Questions

The transposition of the Gas Directive into the national laws of the European countries gives rise to several questions which have yet to be answered :

1. Can we still define public service assignments for gas and electricity? Can access to gas for the under-privileged be considered on the same footing as the search for energy independence through diversification of supplies from abroad? Does the priority given to cogeneration and environmental protection constitute a mission in the public interest? Today, gas is better placed than coal from the environmental standpoint and its European market should develop, especially at electricity generation level.
2. Who will be the regulator tomorrow? Should an independent Commission of ministries and operators be set up (as is the case in the United States or Britain) or should the State be left to take on this mission through a simple ministerial department (system preferred in France)? How will the fields of competence be divided between the Brussels Commission and the various member States and what will be the role of the European Court of Justice? How will disputes connected with the regulator's decisions be settled? Should the regulator's function be transferred to Brussels? How can we make sure that the functions of regulator and those of shareholder will be kept separate when it is the State itself which controls public companies?
3. How will the transition be made between the old and the new institutional system? In particular, how will "stranded costs" be financed, i.e., costs incurred as a result of decisions taken or imposed within a different regulatory context? How can we be sure that these "stranded costs" will not cover part of the costs linked to inefficiency in the behaviour of historical operators? How also can we be sure that these "stranded costs" are not simply a pretext to reduce the beneficial effects that are expected to be achieved from greater competition? (certain European countries tend to overestimate these costs to protect restructuring of their national industry).
4. How will infrastructure tariffs be determined once TPA has become widespread in Europe? (for the time being, tariffs have been established only in the United Kingdom and, on an experimental basis, in Spain). Should access charges be established in relation to a "postage stamp" concept (lump sum toll), or would a "cost-plus" type tariffing system be better, based on the distance actually covered by the gas transported, or should a RAMSEY-BOITTEUX price-cap, hybrid price-cap system be chosen (i.e., a tariffing system which takes into account demand price elasticities) or EOCR (Efficient Component Pricing Rule)? The RAMSEY-BOITTEUX tariffs correspond to a second-best pricing. The principle is the following: the difference between the price paid by the user and the marginal cost supported by the supplier must be low when

(continued on page 22)

European Gas Deregulation (continued from page 21)

the demand-elasticity is high and high when this demand elasticity is low.

The ECPR system was proposed by BAUMOL and SIDAK. The toll includes both the mean incremental cost borne by the network operator as a result of the arrival of a new supplier, and the opportunity cost that he incurs since this supplier takes a customer from him. The mean incremental cost is the cost supported by the operator to satisfy an additional demand on the network. The opportunity cost corresponds to a drop in earnings for the operator when this demand is satisfied by a competitor. Such a system could only be imagined in the case where the operator of the transport infrastructure is also a gas producer and supplier. In addition, measures must be taken to ensure that these tolls are transparent, non-discriminating and do not encourage by-passing of the networks in place, which would be inefficient from an economic standpoint.

The European gas industry is undergoing drastic change. A wind of competition is blowing and this should promote the development of gas, especially for electricity production. However, this competition is also the prelude to industrial restructuring and integration operations and the member States, just like the Brussels Commission, must remain vigilant especially as, in the long term, Europe will become increasingly dependent on imported natural gas (from Russia, the Middle East or Africa). In Europe buyers and sellers have managed to ensure security of supply globally with a network of connected pipes and to impose the net-back logic within long-run purchase contracts. The European gas market was "regulated" through stable relationships among a few number of actors. One of the basic interests that the producer and the distributor have in common is without any doubt ensuring a continuous outlet for the quantity of gas for which both have invested. This supposes a favourable environment that will encourage the gas industry to invest in exploration, production, transmission and distribution. This is the main reason why some minimum level of regulation is necessary in the gas industry. Competition is useful to introduce incentives to efficiency. The role of the European Commission is to limit monopoly rents and to improve the welfare for each consumer. Now it is necessary to organize the "new regulation" inside Europe. First of all, this regulation will be set up by each Government. In the future (in a few years probably) it will be implemented by the European Commission itself. But a European energy policy is not easy in a context in which the U.K. is oil - oriented, the Netherlands gas-oriented, Germany coal-oriented, France nuclear-oriented and Italy dependent on its imports. For European countries natural gas has tended to be an element of complementarity and cooperation, rather than an element of dissension.

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Conference Announcement

Corporate Restructuring of the Global Energy Industry: Driving Forces and Implications

SNS Energy Day, Stockholm, Sweden

October 18, 1999

SNS Energy Day 1999 will review the dramatic changes in the corporate structure of the energy industries that have occurred since the mid-1980s: (a) an extended cross-border reach, both in terms of activities, ownership and financing; (b) a deepened vertical integration; (c) corporate separation of production and transmission in gas and power; (d) emergence of independent middlemen in transport and trade, providing an additional source of supply; (e) mega-mergers of multinational oil and gas giants. Liberalization of trade and investments, deregulation of power and gas, privatization and advances in information technology are the main triggers behind this change. The conference will discuss where the ongoing developments are likely to take us and what they will imply for energy producers and consumers and for society at large. Though the vista is global, some emphasis will be given to the industrialized market economies, and Europe in particular.

The group of prominent contributors to the conference comprises: *Kevin Lillis*, Senior Analyst, U.S. Department of Energy; *Lars Bergman*, Professor, Stockholm School of Economics; *David Humphreys*, Chief Economist at Rio Tinto; *Kjell Roland*, President of ECON, a Norwegian research and consulting group; *Keith Palmer*, Vice Chairman Investment Banking, Rothschild; and *Dennis Mueller*, Professor of Economics in Vienna. Contributors from Shell International and IEF will also take part.

The deliberations should be of immediate interest to high level representatives from energy related industry and banking, to academics with energy oriented specialization, to policy makers in government and to media. The conference should be especially attractive to those interested in broadening their contacts with the energy industries in the Nordic countries. For information contact *Judit Weibull*, telephone: 46-8-5070-2574; fax: 46-8-5070-2515; email: judit.weibull@sns.se

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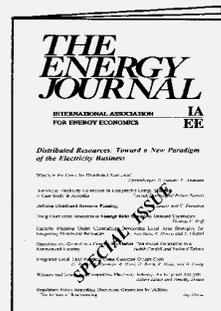
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CTC: The Ultimate Shock Absorber

By Fereidon P. Sioshansi*

During the long and acrimonious restructuring debate in California, the state legislature decided—correctly—that the only practical way to deal with the sticky issue of utility stranded costs was to face up to it. And they did. California Assembly Bill 1890 (AB 1890), which formally restructured the electric power sector in the Golden State and introduced full retail competition in one gigantic step, provided rather generous—some critics would say, too generous—provisions for recovery of stranded costs. The three investor-owned utilities (IOUs) in the state were given an opportunity to recover these costs over a 4-year transition period through a non-bypassable competition transition charge, or CTC. This won the support of the IOUs and their shareholders—a major political force in the state.

From the start, everyone knew that large customers would do well under competition. But what about the small consumers? There were genuine concerns that all the good deals would be taken up by the large customers, leaving the little guys with little or no benefits from restructuring. To placate this important constituency, the politicians decided on an automatic and immediate 10% bill reduction for residential and small commercial consumers—no ifs and buts about it. But, who would pay for this 10% discount? The politicians, never at a loss for innovative financing schemes, found the perfect solution: securitization. By issuing low-interest bonds to recover a portion of their stranded costs, the IOUs could finance the 10% bill reduction.

The resulting compromise has been showing up on IOU customer bills in California every month since January 1998 (see the accompanying sample bill). Together, the CTC and the trust transfer amount, or TTA, allow the IOUs to recover both their stranded costs and fund the 10% legislatively mandated bill reduction for residential and small commercial customers. Few take notice, and fewer understand what it means or how it works.

The TTA, in particular, has been the source of much confusion and negative publicity. On the surface, it appears that the average consumer is paying more for the TTA than the 10% discount received. Many consumers interpret this as a negative bargain. It is confusing. But, in principle, it is straightforward. Consumers are paying a premium over a 10-year period—the maturity of the securitized bonds—to receive the immediate 10% bill reduction. It is similar to refinancing one's home mortgage to reduce monthly payments. Despite all the complexities and the confusion, there actually is a real, automatic, and immediate 10% bill reduction. Small consumers are paying 10% less than what they would have paid had there been no AB 1890. And, consumers do not have to do anything to take advantage of this. By sticking with their current utility distribution company, or UDC, they automatically get the 10% discount. Politicians are not as dumb as they sound!

The scheme gets even more complicated because there is

* Fereidon "Perry" Sioshansi is a Partner with Convector Consulting Inc. in Menlo Park, CA. He edits and publishes the *EEnergy Infomer*, a monthly newsletter. This is an edited version of an article which appeared in the April 1999 issue and is available on the web at <http://members.aol.com/eeinfomer>

an overall rate freeze in effect during the 4-year transition period in California. Since the monthly weighted average price of energy—set by the Power Exchange (PX)—varies from month to month, the CTC has to act as a shock absorber to compensate. Consequently, the CTC tends to be high—i.e., allowing for rapid recovery of stranded costs—when the average PX price for the month is low. The reverse happens during months when the PX price soars—such as during the hot summer months in California. As the Table below illustrates, when the PX price gets too high, the CTC becomes negative to maintain the overall rate freeze. During these months, the IOUs do not recover any stranded costs. The TTA is not affected by variations in the PX price.

The Benefits And Complexities Of Restructuring

Sample bill for residential utility distribution company (UDC) customer receiving the legislatively mandated 10% bill reduction

Total Charges	\$78.19
Legislated 10% Reduction	7.82 -
Net Charges	\$70.37

The net charges shown above include the following component(s). Please see definitions on Page 2 of the bill.

Electric Energy Charge	\$0.04446/Kwh*	\$38.59
Transmission		2.90
Distribution		22.13
Public Purpose Programs		2.78
Nuclear Decommissioning		0.35
Competition Transition Charge (CTC)		10.40 -
Trust Transfer Amount (TTA)		14.02

*This rate is based on the weighted average costs for purchases through the Power Exchange. This service is subject to competition. You may purchase electricity from another supplier. (Call 1-800-743-0040 for a supplier list.)

SOURCE: Pacific Gas & Electric Co.

CTC: The Ultimate Shock Absorber*

The competition transition charge, or CTC, is residually determined every month, which means it fluctuates to compensate for variations in the PX price.

*The percentages shown are rounded and apply to PG&E

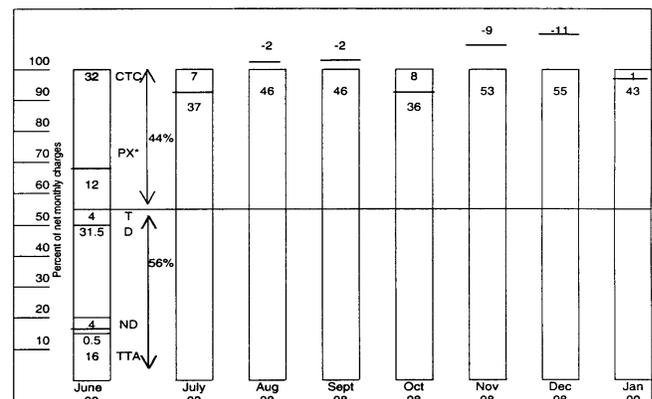


Chart Legend
 CTC Competition transition charge, residually determined.
 PX Weighted average cost of energy for the month purchased by the utility distribution company (UDC) from the California Power Exchange. Variable from month to month. See Table on Page 5.
 T Transmission charges.
 D Distribution charges.
 PPP Public Purpose Programs (renewable energy, energy efficiency, R&D, low-income assistance).
 ND Nuclear decommissioning charges.
 TTA Trust Transfer Amount. Goes to finance bonds issued to pay for the 10% mandated rate reduction.

It's Anybody's Guess

The weighted average cost of energy as determined by the California Power Exchange for selected months of 1998-99

Month*	¢/kWh
June 98	1.258
July	3.746
August	4.732 ¹
September	4.456 ¹
October	3.481
November	4.371 ¹
December	4.4448 ¹
January 99	3.451

Source: PG&E residential bills, 1998-99

*The actual billing cycle does not generally coincide exactly with the calendar months.

¹ High PX price resulting in negative CIC. See chart on previous page.

Because of the variability of the PX price, it's anybody's guess how long it would take the three big IOUs to recover their stranded costs. The regulators, aware of this, have required the IOUs to keep detailed records on their recovered stranded costs. (There was one such day of reckoning in March; see article below.) AB 1890 stipulated that the utilities would cease collecting any CIC—except for a few specific items—beyond the 4-year transition period, regardless of any shortfall. However, they would stop collecting the CIC earlier if they have recovered their full stranded costs.

SDG&E: Stranded Costs? What Stranded Costs?

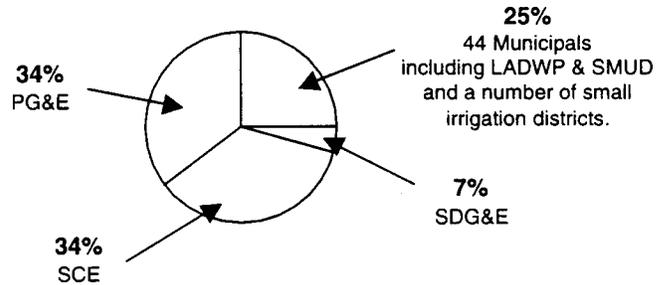
The three large investor-owned utilities (IOUs) in California had a day of reckoning in March with the California Public Utilities Commission (CPUC). The CPUC periodically checks their books to see how the recovery of stranded costs through the competition transition charge (CIC) is progressing. The IOUs, of course, would like to collect as much and as fast as allowed under AB 1890. The CPUC, on the other hand, would like to make sure that the IOUs stop collecting the CIC as soon as they have recovered their allowed stranded costs. It is the usual regulator versus the monopoly cat-and-mouse game.

San Diego Gas & Electric Company, now a unit of Sempra Energy, had a bit of good news. It told the CPUC that it has already recovered most of its stranded costs. As if that weren't enough, the company has petitioned the CPUC to unilaterally reduce its rates by an additional 10% beyond the 10% already mandated by AB 1890. The CPUC couldn't be happier. Here is solid proof that restructuring is working, rates are dropping, customers have choices, and everybody is happy in the Golden State.

Is this cause for celebration, and what's behind SDG&E's early recovery of its stranded costs? Yes, a celebration—albeit a small one—may be appropriate, but let's not get too excited yet. SDG&E has always been a marginal player in California. It serves a relatively small number of electric customers in the San Diego metropolitan area, accounting for approximately 7% of the kWh sold in the Golden State—compared to roughly 34% each for Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E), the other two big IOUs (see Chart). The remaining 25% of the kWhs sold in the state come from 44 municipal entities and small irrigation districts that are not subject to CPUC regulations.

Who's Who In The Golden State

Approximate market share (by kWh) before restructuring



Aside from being a marginal player, SDG&E has been fortunate in the sense that it had very little in stranded costs to begin with. Its major liability was a 20% share in the San Onofre Nuclear Generating Station (SONGS), otherwise owned by SCE. Moreover, SDG&E has been able to eliminate much of its stranded costs through the sale of a few power plants at well above market value. Now, the company can boast that it will stop collecting the CIC two-and-a-half years ahead of schedule and ahead of the others. It claims that its customers will reap \$400 million in benefits as a result of the proposed 10% reduction in rates—this, in addition to the 10% already mandated by AB 1890. It must be sweet revenge for the ugly duckling that once had the most expensive electricity prices in California.

The news from the other two players was not as good. At the same CPUC hearing, SCE and PG&E claimed that they may need the full allowed duration of the transition period—through March 2002—to recover their stranded costs. Neither could say with any degree of confidence just when, given the considerable uncertainties about the PX prices over the next couple of years. The best they could do was produce multiple scenarios. The lower the average PX prices, the sooner they would be able to stop collecting the CIC.

PG&E, for example, in its official submission to the CPUC (18 February 1999), presented three scenarios based on average PX prices of \$15, \$25, and \$35/MWh—all plausible numbers. It states that "because of the uncertainties surrounding ... [the] assumptions, as well as the uncertainty associated with the PX price, it is not possible to develop any 'best' estimate of the end of the rate freeze period" (emphasis added). What other uncertainties—other than the PX price—is PG&E referring to?

- The market value of its vast and literally priceless hydro-electric facilities;
- The cost of reliability must-run (RMR) services;
- The cost of ancillary services which—along with the PX price—is highly uncertain;
- The volume and make-up of sales to retail customers (i.e., the UDC market share over the next two-and-a-half years);
- The outcome of regulatory proceedings with both the CPUC and FERC—there are many other items in dispute that would affect PG&E's stranded costs;
- The qualifying facilities (QFs) variable energy costs; and,
- The cost of purchased power, since PG&E must now buy all of the energy its UDC customers consume from the PX.

(continued on page 26)

Stranded Costs (continued from page 25)

So what's the answer? The best PG&E—and the story's much the same at SCE—can do is shown on the accompanying Table: you tell me the PX price—and a few other critical variables—and I'll tell you when I will stop collecting the CTC.

When Will It Ever End?

The end of CTC collection will depend, to a large extent, on the average PX price.†

Assumed Average PX Price*	CTC Collection Will Cease ...
\$15 per MWh	December 2001
\$25 per MWh	March 2002
\$35 per MWh	March 2002

SOURCE: PG&E filing to CPUC, February 1999

*The weighted average PX energy price for SCE for all of 1998 was 3.25¢/kWh or \$32.50/MWh. The figures for PG&E are in the same ballpark.

†There are a number of other significant variables, the most important being the market value of hydro assets.

It's the usual answer: everything depends on everything else.

BIEE Announces Seminar Series

The British Institute of Energy Economics (BIEE) is planning a series of seminars to encourage debate amongst its membership on key energy policy issues in the run up to its September 20/21 Conference at St John's College Oxford. Mike Parker will be discussing "Developments in UK Energy Policy" at the DTI London on 12 May.

The seminars then move outside London, first of all to Scotland, where on 6th May the first Scottish parliament will be elected for almost 300 years, with a wide range of policies devolved to the new parliament. These powers include ability to vary income tax up or down by 3p in the pound, control of, for example, health, education, planning and building control, inward investment but excluding matters such as the constitution, foreign affairs, defence, and taxes. A seminar is thus scheduled for June 2nd, 5pm at the Centre for Energy, Petroleum and Mineral Law and Policy at Dundee University to discuss the "Impact of Scottish Devolution on the Energy Sector and North Sea Petroleum". Professor Thomas Waelde will address the border delineation issue and John Swimney, the SNP spokesperson on finance and a speaker from Wood Mackenzie have been invited. Professor Paul Stevens is hosting the event. The seminars then move to St Anthony's College Oxford when on June 24, 2pm the BIEE will be discussing "The Changing Role of OPEC in World Oil Markets". Dr Paul Horsnell of the Oxford Institute of Energy Studies is organising the seminar. The normal programme of BIEE presentations is continuing with Anna Walker of the DTI reviewing recent UK policy developments and Jonathan Stern looking at Russian gas and energy market developments. Callum McCarthy, Director General of the Regulatory Office for Gas and Electricity (Offer and Ogas) will be addressing the BIEE AGM on November 1st.

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British Institute of Energy Economics
THE 1999 BIEE CONFERENCE

St John's College, Oxford
September 20th and 21st 1999

Sponsored by BP-Amoco, DIT, National Grid, and Oxera

A New Era for Energy? Price Signals, Industry Structures and Environment

Plenary Speakers

Professor Peter Davies, BP Amoco

Michelle Michot Foss, University of Houston

Dr. Dieter Helm, OXERA

Gordon MacKerron, SPRU

Robert Mabro, Oxford Institute for Energy Studies

The conference will focus on the interplay of competitive market forces, social and environmental concerns and technological change, that is driving the energy business towards a new era. The new era seems likely to be characterised by low prices yet pressures to constrain energy use for environmental reasons. At the same time there is rapid structural change in most energy industries as markets liberalise and become more competitive. All this raises complex problems and challenges both for industry, policy-makers and regulators.

The conference will bring together, from the UK and elsewhere, university economists and others with specialisms in energy issues, postgraduate students and also economists and policy-makers working on energy issues in industry, government and related organisations.

As well as the plenary sessions, the conference will split into parallel sessions. Each parallel session will have papers presented on a particular topic followed by discussion and questions. A conference pack will be sent to participants a few weeks in advance of the conference, detailing the agenda, and arrangements. *Early registration is advised with numbers strictly limited to 200.*

Suggested topics of the sessions include:

- energy prices and energy demand
- energy regulation and taxation
- structural change in the energy business
- strategies of energy companies in the new era
- growing integration of UK and EU energy markets
- the economic impacts of the various 'flexibility mechanisms' (trading, clean development mechanism, etc.) envisaged at Kyoto
- other sessions relating to the theme will be arranged according to the papers offered.

As with previous conferences (*The UK Energy Experience: A Model or Warning?* and *The International Energy Experience*) papers presented at the conference will be selected for an edited volume from a major publisher available at additional cost after the conference.

The conference will start at 12pm on Monday 20th September 1999 and will close at 4pm on Tuesday 21st September.

Meals and accommodation at St John's College, Oxford are included in the conference fee. **There will be a conference dinner and reception on Monday 20th September in the College dining room followed by an after dinner speech by Robert Mabro.**

The conference fee is £220 including VAT (\$US 365 / Euro 315) for BIEE and IAEE members. For non-members, the fee is £240 including VAT (\$US 400 / Euro 345).

(A concessionary rate is available to academics, students and pensioners at a rate of £140 [\$US 230 / Euro 200])

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Title (Mr/Mrs/Ms/Miss/Other) _____ Family/Surname _____

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

17th Annual North American Conference of the USAEE/IAEE, Boston, Massachusetts, October 27-30, 1996
Single Volume \$65.00 - members \$85.00 - non-members

This publication is 533 pages and includes articles on the following topics:

Regulation of Greenhouse Gases
Market Power in the Utility Sector
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Latin American Deregulation
Utility Restructuring and Sustainability
Economics of Oil Consumption
Regulation of Emissions
International Oil Issues
U.K. Deregulation
Oil and Gas Resource Development
Economic Impact of Environmental Regulation
Fiscal Issues in the Petroleum Industry

Global Energy Transitions: With Emphasis on the Last Five Years of the Century

19th IAEE International Conference, Budapest, Hungary, May 27-30, 1996
Single Volume \$55.95 - members \$75.95 - non-members

This publication is 534 pages and includes articles on the following topics:

Indicators of Energy Use and Efficiency
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East European Power Systems Development
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Energy Strategy - Is Competition Really the Solution?
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Oil and Gas Policy
Asian Energy Market Development
Investments - Financing in Eastern Europe
Baltic Energy System Development

Into the Twenty-First Century: Harmonizing Energy Policy, Environment, and Sustainable Economic Growth

18th IAEE International Conference, Washington, DC, July 5-8, 1995
Single Volume \$55.95 - members \$75.95 - non-members

This publication is 528 pages and includes articles on the following topics:

Electric Power and Economic Development
Energy Prices and Aggregate Economic Behavior
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Oil and Gas Energy Issues
Empirical Studies of Energy Efficient Behavior
Automobile Use of Gasoline and Alternative Fuels
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The Jane Carter Prize

The British Institute of Energy Economics, the International Association for Energy Economics and the Association for the Conservation of Energy invite the submission of essays for the 1998-99 award of the Jane Carter Essay Prize. The prize for 1998-99 will be a cash award of US \$800 together with a plaque.

Essays can be on any aspect of energy efficiency and conservation or on aspects of general energy and environmental policy which are relevant to energy efficiency. The aim is to encourage new thinking on these subjects. The emphasis of the essay should, therefore, be on the policy, rather than the scientific or technical, aspects of the subject.

The competition is open to anyone under the age of thirty-five. Essays should not be more than 8,000 words long. They can be based on work done for another purpose, e.g., an academic thesis or policy report, but the results of that work should be presented in an original form. The winning essay will be considered for publication in a range of energy and environmental journals.

Essays should be submitted in English, in triplicate and typed form by 30 June 1999 to:

Mary Scanlan, Administration Secretary
British Institute of Energy Economics
37 Woodville Gardens
London W5 2LL
United Kingdom

Each essay should include a 150 word summary. The name, address and age of the author should be on a separate sheet which can be detached from the essay which will be judged anonymously. Manuscripts will not be returned.

Special Issue of *The Energy Journal* on Analyses of Kyoto Protocol Due Shortly

During 1998 the Energy Modeling Forum at Stanford University has been coordinating a set of standardized comparisons of the energy-economic consequences of various implementations of the Kyoto protocol on climate change policy. Thirteen modeling teams have participated in this work. A special issue of *The Energy Journal* is planned which will consist of a paper by each modeling team describing key insights obtained from its analysis of the standardized scenarios, as well as from analyzing other relevant scenarios. Also included will be an introductory chapter laying out the study design and comparing model results for four core scenarios. The wide variety of model structures will provide a rich set of model comparisons and policy insights.

The special issue will be edited by John Weyant, EMF Director and coordinator of the study. He will be assisted by the other members of the study design - Henry Jacoby of MIT, Jae Edmonds of Battelle Northwest National Laboratory and Richard Richels of EPRI.

Publication is planned for May or early June. Members who regularly receive *The Energy Journal* will receive copies of the special issue as part of their membership.

CALL FOR PAPERS

Allied Social Science Associations Meeting
Boston, MA - January 7-9, 2000

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

The theme for the session will be *Current Issues in Energy Economics and Modeling*.

If you are interested in presenting please send an abstract of 200-400 words to Carol Dahl at cadahl@mines.edu by June 30, 1999. Final decisions will be made by July 15.

For complete ASSA meeting highlights please visit <http://www.vanderbilt.edu/AEA/index.htm>

Alex Kemp Appointed Official Historian of North Sea Oil and Gas

Professor Alex Kemp of the University of Aberdeen has been appointed official historian for North Sea Oil and Gas by British Prime Minister, Tony Blair. Alex is a long standing IAEE member, one who has served as European Editor of *The Energy Journal*, and on various award committees.

The Principal of the University of Aberdeen, said "The selection of Professor Kemp to undertake this Official History is a unique and fitting recognition of his long-standing research work on North Sea oil."

Alex sees the undertaking as a unique opportunity to research in depth many issues relating to North Sea oil and gas which have not so far been fully explored.

The objective of the research is to produce a comprehensive, authoritative history of the development of UK North Sea Oil and Gas starting from the early 1960's to more recent times. While emphasis will be given to policy aspects, all the main issues involved in the development of the industry will be examined. As an Official Historian, Alex will have access to all official papers, including those falling within the 30-year rule. This gives the study its unique flavour.

The work should reveal insights on important topics such as the approach to licensing, the monopolistic role of the Gas Council, the establishment (and abolition) of BIOC, the implementation of procurement policy, the impact of the special tax regime in 1975, depletion policy, the privatization of British Gas, whether an 'Oil Fund' was seriously considered, and the economics of safety policy.

The appointment of Alex Kemp to this position is a signal honor to one of our members.

Campbell Watkins

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Publications

Gas Liberalisation in Europe. Price: £ 399. Contact: Management Reports, ICBI, 8th Floor, 29 Bressenden Place, London SW1E 5DR, United Kingdom. Phone: 44-171-850-5103. Fax: 44-171-850-5101.

The Future of the European Electricity Market. Price: £ 399. Contact: Management Reports, ICBI, 8th Floor, 29 Bressenden Place, London SW1E 5DR, United Kingdom. Phone: 44-171-850-5103. Fax: 44-171-850-5101.

A Guide to Policies for Energy Conservation. Price: \$80.00. Contact: Katy Wight, Edward Elgar Publishing, Inc., 6 Market Street, Northampton, MA 01060. Phone: 413-584-5551. Fax: 413-584-9933. E-mail: kwight@e-elgar.com

Turning Off the Heat: Why America Must Double Energy Efficiency to Save Money and Reduce Global Warming. Price: \$26.95. Contact: Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228. Phone: 716-691-0133. Fax: 716-691-0137. E-mail: pbooks6205@aol.com

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Calendar

10-14 May, 1999, Basic Petroleum Economics. University of Dundee, United Kingdom. Contact: Moira McKinlay, Centre for Energy, Petro. And Min. Law & Policy, University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854.

11-13 May, 1999, Antitrust in Energy Markets: A CLE Accredited Course. University of Wisconsin-Madison. Contact: Wisconsin Public Utility Institute. Phone: 608-263-4180. Fax: 608-265-2737. E-mail: wpui@bus.wisc.edu

17-18 May, 1999, Energy '99 - 8th Annual Latin American Energy Conference. Hilton Ia Jolla. Contact: Institute of the Americas, 10111 North Torrey Pines Road, La Jolla, CA 92037. Phone: 619-453-5560. Fax: 619-453-2165.

17-21 May, 1999, World Fiscal Analysis for Petroleum. University of Dundee, United Kingdom. Contact: Moira McKinlay, Centre for Energy, Petro. And Min. Law & Policy, University of Dundee, Dundee DD1 4HN, Scotland, UK. Phone: 44-1382-344303. Fax: 44-1382-345854.

18-20 May 1999, Electricity in Europe '99. Berlin, Germany. Contact: Conference Secretary, Electricity in Europe '99, ICBI, 8th Floor, 29 Bressenden Place, London SW1E 5DR. Phone: 44-171-915-5103.

27-29 May, 1999, Prospects for Cleaner Fossil Fuels Systems in Sustainable Development. Ankara, Turkey. Contact: U.S. Energy Association, 1300 Pennsylvania Avenue, NW Suite 500, Washington, DC 20004-3022. Phone: 202-312-1230. Fax: 202-682-1682.

7-9 June 1999, Electricity in Europe Congress '99. Berlin, Germany. Contact: Conference Administrator, ICBI, 8th Floor, 29 Bressenden Place, London SW1E 5DR, UK. Phone: 4-171-915-5103.

8-9 June 1999, Electricity in Europe Congress '99. Berlin, Germany. Contact: Conference Administrator, ICBI, 8th Floor, 29 Bressenden Place, London SW1E 5DR, UK. Phone: 44-171-915-5103.

8-9 June 1999, Central/East European Gas Conference. VNG Corporate Headquarters, Leipzig, Germany. Contact: Esther Musoke, Course Administrator, The Alphatania Partnership, Rodwell House, 100 Middlesex Street, London E1 7HD, United Kingdom. Fax: 44-171-650-1401. E-mail: training@alphatania.com

9-10 June 1999, ECAR Power Markets: Plugging into the Powerful Midwest. Columbus, Ohio, USA. Contact: FT Energy USA, 13111 NW Freeway, Suite 520, Houston, TX 77040. Phone: 713-460-9200. Fax: 713-460-9150. E-mail: conferences@ftenergyusa.com

9-12 June 1999, 22nd IAEE International Conference. Rome, Italy. Contact: IAEE Headquarters, 28790 Chagrin Blvd., Ste. 350, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: iaee@iaee.org URL: www.iaee.org

14-15 June 1999, Implementing the Kyoto Protocol. Chatham House, London. Contact: Georgina Wright, Royal Institute of International Affairs, Chatham House, 10 St. James's Square, London SW1Y 4LE, United Kingdom. Phone: 44-171-957-5700. Fax: 44-171-321-2045. E-mail: gwright@ria.org

14-26 June, 1999, Sixth International Training Program on "Utility Regulation and Strategy." Gainesville, Florida. Contact: Public Utility Research Center, PO Box 117142, Matherly Hall 205, University of Florida, Gainesville, FL 32611. Phone: 352-392-3655. Fax: 352-392-7796. E-mail: purrecon@dale.cba.ufl.edu URL: www.cba.ufl.edu/eco/purc

17-18 June 1999, Private Power in Central America. Szeaton Biscayne Bay, Miami, Florida, USA. Contact: Registration Dept., Center for Business Intelligence, 500 W. Cummings Park, Suite 5100, Woburn, MA 01801. Phone: 781-939-2438. Fax: 781-939-2490. E-mail: registrar@cbinet.com

21-22 June, 1999 Third Millennium Petroleum Conference. London, UK. Contact: Fax: +27-11-782-3188 or +44-1372-747947.

22-25, June, 1999, International Fuel Ethanol Workshop. Cedar Rapids, Iowa. Contact: Kathy Bryan, Bryan & Bryan, Inc. Phone: 719-942-4353.

6-7 July, European Gas '99. Krasnapolsky Hotel, Amsterdam.

(continued on page 32)

Conference Proceedings 21st IAEE International Conference Quebec, Canada May 13-16, 1998

The Proceedings from the 21st International Conference of the IAEE held in Quebec, Canada, are now available from IAEE Headquarters. Entitled *Experimenting with Freer Markets: Lessons from the Last 20 Years and Prospects for the Future*, the proceedings are available to members for \$89.95 and to nonmembers for \$99.95 (includes postage). Payment must be made in U.S. dollars with checks drawn on U.S. banks. To order copies, please complete the form below and mail together with your check to: Order Department, IAEE Headquarters, 28790 Chagrin Blvd., Suite 350 Cleveland, OH 44122, USA

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Calendar (continued from page 31)

Contact: Global Business Conferences, Sycamore House, 5 Sycamore Street, London EC1Y 0SG, United Kingdom. Phone: 44-171-608-3491. Fax: 44-171-490-2296.

August 29 - September 1, 1999, 20th USAEE/IAEE Annual North American Conference - "The Structure of the Energy Industry: The Only Constant is Change." Orlando, Florida, USA. Contact: USAEE/IAEE Headquarters, 28790 Chagrin Blvd., Ste. 350, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: iaee@iaee.org URL: www.iaee.org

15-17 September 1999, PowerTrends. Philippines. Contact: Alice Gh Project Manager, Interfama International Pte Ltd., 1 Maritime Square #09-36 World Trade Centre Singapore 099253. Phone: 65-2766933. Fax: 65-2766811. E-mail: w2608@singnet.com.sg

22-24 September 1999, 2nd International Energy Symposium. Stift Ossiach, Austria. Contact: Dr. A. Reuter, Verbundplan GmbH, Kohldorfer Strasse 98, A-9020 Klagenfurt, Austria. Phone: 43-1-536 05-32560. Fax: 43-463-23 97 29. E-mail: reutera@verbundplan.at

26 September - 1 October, Natural Gas: The Commercial and Political Challenges (Alphatania Training Course). Cricklade, Wiltshire, England. Contact: Esther Musoke, Course Administrator, The Alphatania Partnership, Rodwell House, 100 Middlesex Street, London E1 7HD, United Kingdom. Fax: 44-171-650-1401. E-mail: training@alphatania.com

28-29 September 1999, 1999 Natural Gas Conference. Montreal, Quebec, Canada. Contact: Industrial Gas Users Association. Phone: 613-236-8021. Fax: 613-230-9531. E-mail: igua@igua.ca

18 October 1999, SNS Energy Day 1999: Corporate Restructuring of the Global Energy Industry: Driving Forces and Implications. Stockholm, Sweden. Contact Judit Weibull,

Phone: 46-8-507-025-74. Fax: 46-8-507-025-45.

18-20 October 1999, Hydropower into the Next Century. Grunden, Austria. Contact: Aqua-Media International Ltd., Westmead House, 123 Westmead Road, Sutton, Surrey, SM1 4JH, United Kingdom. Phone: 44-181-643-4727. Fax: 44-181-643-8200. E-mail: conf@hydropower.cix.co.uk

26-28 October 1999, PowerMart '99. AstroArena, Houston, Texas. Contact: FT Energy, 13111 Northwest Fwy, Suite 520, Houston, TX 77040. Phone: 713-460-9200. Fax: 713-460-9150. URL: www.powermart.com

26-28 Interactive Energy '99. Adam's Mark Hotel, Houston, Texas. Contact: Zeus Development Corporation, 2424 Wilcrest, Suite 250, Houston, TX 77042. Phone: 713-952-9500. Fax: 713-952-9526. URL: www.interactiveenergy.com

27-30 October 1999, 2nd International Exhibition on Electric Power Equipment and Technology. Shanghai, China. Contact: Crystal Chan, Project Executive, Adsale People, Inc., 4/F Stanhope House, 734 King's Road, North Point, Hong Kong. P 408-986-8384. Fax: 408-986-1580. E-mail: adsaleusa@worldnet.att.net

7-12 November 1999, The Gas Chain: From Reservoir To Burner Tip (Alphatania Training Course). Cricklade, Wiltshire, England. Contact: Esther Musoke, Course Administrator, The Alphatania Partnership, Rodwell House, 100 Middlesex Street, London E1 7HD, United Kingdom. Fax: 44-171-650-1401. E-mail: training@alphatania.com

7-10 June 2000, 23rd IAEE International Conference. Sydney, Australia. Contact: IAEE Headquarters, 28790 Chagrin Blvd., Ste. 350, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: iaee@iaee.org URL: www.iaee.org

23-28 July 2000, ENERGEX '2000 Conference, Las Vegas, USA. Contact: Dr. Chern Zhou at fax: 219-989-2898, e-mail: czhou@alumet.purdue.edu or Dr. Brian Golchert at fax: 630-252-5210. E-mail: brian_glochert@ggate.anl.gov

IAEE Newsletter

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