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United States Association for Energy Economics. An Affiliate of the IAEE

Dialogue

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Vol. 11, No. 2

July 2003

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Integrating the Energy Markets in North America: Issues & Problems, Terms & Conditions

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For further information on this conference, please fill out the form below and return to USAEE Conference Headquarters.

Integrating the Energy Markets in North America:

Issues & Problems, Terms & Conditions

23rd IAEE North American Conference

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President's Message



Yesterday was July 4th and despite the ever-present possibility of rain here in London, Laurie and I managed to arrange a small barbeque to celebrate Independence Day. After dark we were surprised to see the sky over Primrose Hill filled with a series of red, white and blue starbursts- organized by some of the other Americans who make up more than five percent of the population here. Earlier in the day we had an e-mail from a friend who is serving with the coalition forces in Iraq- who said that his platoon was having its own barbeque and that things were

not nearly as bad or chaotic in Iraq as the media have portrayed over the last few weeks.

In my March letter, I was mulling the possibility that the quest for oil is the main driver of US international energy policy- certainly that seems to be the view in many European countries. My view is that oil is a driver, but not the main one. It's not the oil that matters, but what gets done with it. In Iraq, oil could be a positive force to help jump-start the Iraqi economy and bring employment, skills, technology, and hope to the Iraqi people. Oil could also empower corruption and support ineffective government. For better or worse, the US and UK are engaged in nation-building in Iraq and political economy of oil may end up at the heart of developments there. Energy economists may be called upon to help put order into these issues.

Should Iraq leave OPEC? Should state-owned oil assets be privatized? Should foreign investment be encouraged? Should Iraq have a development fund or oil profits distribution policy? I recently asked many of my clients and colleagues in government, academia, and industry to respond to these oil policy questions with their own recommendations and observations. Many of them are energy economists. Most of them agreed that these decisions would be best left to a legitimate new Iraqi government, especially the question of OPEC membership.

But there is little doubt that the sentiment overwhelmingly favors a move in Iraq toward market mechanisms. Rapid, but not necessarily massive, foreign investment won strong approval as well. Although good cases were made for Iraqis to do a lot of work themselves, the ability to attract technology and managerial skill through FDI is seen as an appealing option for Iraq.

After I published the results of my survey, I heard from two energy economists who teach in the United States. One pointed out that virtually all of the respondents were probably educated in the west- even many of the middle-eastern ones. "This culture of taking time out of your busy schedule to express your opinion and contribute is a western trait." He said that the power of the western elite in the mid-east is limited- they are constrained by traditional leaders, most of whom have never been in the west. Another friend opined that "imposing anything from the outside will not work and will only fuel the many conspiracy theories floating in the region about the US and its goals."

The primary goal of the USAEE is to provide a forum for the exchange of ideas, experience and issues among professionals interested in energy economics. Getting things 'right' in Iraq is critical to both the US and to the Iraqi people- and figuring a way to encourage good energy economics without imposing it looks like it's going to be a real challenge. A paper written last fall by another USAEE member contained a quote that seems appropriate here. A dozen years ago, in the aftermath

(continued on page 27)

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Editor: Wumi Ildare

Submissions

Articles, notices, news of chapter events and relevent energy news can be sent to the editor.

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USAEE News Editor's Corner

The fall edition of USAEE *Dialogue* includes five articles addressing various topics, including the U.S. natural gas market conditions; household energy consumption in the U.S.; the multiple meanings of transparency since the collapse of Enron; an appraisal of the energy support programs in Eastern Europe; and economic displacement opportunities in the U.S. southeastern power markets.

The article by Dr David Dismukes and Dr. Dmitry V. Mesyanzhinov provides estimates of the potential savings that could accrue from a vibrant regional power market. These estimates, according to the authors "should be thought of as the 'book-ends' of the economic opportunities for the region." The authors hope, this analysis will cause further discussion on "why so many older, uneconomic units continue to run in this region, when more efficient, environmentally sensitive resources located in the region could be utilized."

Dr. Stephen P. Brown discusses the potential crisis stemming from a natural gas supply shortage, which has more than doubled spot natural gas prices during the past year. Further, he addresses why natural gas prices have risen sharply, the outlook for natural gas prices, and some of the implications for the U.S. economy.

Dr. Mary-Ellen Boyle in her article explores the evolving meanings of transparency, outlines managerial responses, and explains how cultural characteristics can be incorporated into transparency management. She concludes that effective management of the new transparency, however defined, requires knowledge, formal programs and leadership, and open communication, empowerment and trust.

Stephanie J. Battles and Muriel V. Moorhead study the implications of minority populations on residential energy consumption. The authors highlight the determinants of population growth and energy demand in an uncertain environment. They report that if there is no growth in population mix, *ceteris paribus* then energy consumption might increase by 21 percent over period, 1995 to 2025. However, if there is a slowdown of immigration or a reduction in fertility rates for minority households, then the growth in energy consumption is reported to be higher at 28 percent.

Robert E. Borgström offers many reasons to be optimistic regarding the Romanian gas sector over the long-term. He reviews a US-funded program of regulatory and restructuring assistance in support of the Romanian gas sector. He concludes with guarded optimism that such efforts could help transitional economies in their efforts to create competitive, free markets within the context of independent regulation.

Joe Dukert takes a look at the current Natural Gas scare by digging into the stats over the past decade, and offers explanations as to why the current opinions on Natural Gas supply and LNG's future role may not be accurate.

As always, we encourage submissions of articles from the membership. Send new articles, notices, news of chapter

events, and relevant energy news to the editor via e-mail (wumi@lsu.edu), by fax (225-578-4541) or by regular mail (Center for Energy Studies, 1107 Energy, Coast and Environment Building, Louisiana State University, Baton Rouge, LA 70803). Members are also encouraged to let the *Dialogue* know of changes in their position and/or honors received. Remember, this is your *Newsletter*.

Wumi Iledare

USAEE Website Updated

USAEE continues to find ways to improve usaee.org, as recently redesigned our website. Aside from the new look, you can still find the following features:

- √ Online Energy Discussion Forum
- √ Overview/Objections of USAEE
- √ USAEE North American Conference Information
- √ Council and Chapter Presidents Listing & Contacts
- √ Chapter News and Conference Information
- √ Full Issues of USAEE's *Dialogue*
- √ Links to IAEE's Energy Web Links and Member Database

We are sure you will find our new site full of up-to-date information. Please feel free to drop USAEE Headquarters an email at usaee@usaee.org if you have any suggestions on how we can continue to improve and expand our website.

Start your own USAEE Chapter

The requirements for starting a USAEE Chapter are straightforward – You must have a viable group of at least 20 individuals all of whom need to join USAEE and have organized to the point of adopting a set of bylaws and a group of elected officers. Sample bylaws can be requested and obtained by calling USAEE Headquarters at 216-464-2785. USAEE dues are \$65.00 per person, per year for a subscription to the USAEE *Dialogue*, *The Energy Journal* and *IAEE Newsletter*. Student membership is \$35.00. USAEE bills members directly for their membership in the Association. Chapter membership must be open to all individuals whose work or interest is in the field of energy economics. If you have any further questions regarding the establishment of a USAEE Chapter, please do not hesitate to contact David Williams at USAEE Headquarters, phone: 216-464-2785; email: usaee@usaee.org A complete Chapter start-up kit can be mailed to you.

Dialogue Disclaimer

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provides critical input to energy policy decisions. USAEE encourages its members to consider and explore the policy implications of their work as a means of maximizing the value of their work. USAEE is therefore pleased to offer its members a neutral and wholly non-partisan forum in its conferences and web-sites for its members to analyze such policy implications and to engage in dialogue about them, including advocacy by members of certain policies or positions, provided that such members do so with full respect of USAEE's need to maintain its own strict political neutrality. Any policy endorsed or advocated in any USAEE conference, document, publication, or web-site posting should therefore be understood to be the position of its individual author or authors, and not that of the USAEE nor its members as a group. Authors are requested to include in an speech or writing advocating a policy position a statement that it represents the author's own views and not necessarily those of the USAEE or any other members. Any member who willfully violates the USAEE's political neutrality may be censured or removed from membership.

New Members of USAEE

The Following individuals joined the USAEE in the period of February, 2003 to June, 2003. Welcome!

Shakeb Afsah - Performeks LLC
Erin Baker - University of Massachusetts
Mushvig Bayramov - University of Oklahoma
James G Bohn - The Brattle Group
Alfred J Boulos - Boulos International
Catharine L Cernell
Mark S Allen - Sandia National Laboratories
James Barrett - Center for the Advmt of Geonomics
Shawn Bennett
Richard Bone - Texas General Land Office
Mary-Ellen Boyle - Clark University
Ami V Choksi
Helen Croskell - Amerada Hess Corp
Robert J Eagan - Sandia National Laboratories
Lowell Feld - Energy Information Administration
L Peter Galusky Jr - Marathon Ashland Petroleum
Alan D Crane - Protiviti Consulting
Donald Durack - Cinergy Corp
Chuck Fannin - CastleArk Management
Timothy Fitzgibbon - McKinsey & Co
Joel M Glantz - Performance Metrics
Gregory Gleason - University of New Mexico
Denzel J Hankinson - Econ One Research
Stanley H Harison - BP, Plc
Maithili Lyer - Lawrence Berkeley Nat'l Laboratory
Mark Newton Lowry - Pacific Economics Group
Hurst K Groves - Ctr for Energy Marine Trans & Pub
Peter C Harris - Headland International
Rawle Hollingsworth - Michigan State University
Michael R Keene - CILCO
Alfonso Madrid - Cinergy Capital & Trading Inc
Douglas F McDonald - Meridian Energy Corp
Paul McNutt - ConocoPhillips
Kate Offringa - Alliance to Save Energy

Bruce Phillips - The NorthBridge Group
Jennifer Rano - University of Oklahoma
Robert L Snow
Daniel McGroarty - White House Writers Group
James Morrise - Booz Allen Hamilton
Richard J Olsen - Technology Commercialization Inc
Russell Profozich - Nexant Inc
Lori S Schnell - Empowered Energy
Paul Sullivan - National Defense University
Guodong Sun - Harvard University
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David Sumi - PA Consulting Group
James R Tauge - Murphy Oil Corp
Stephen R Trujillo - Samson International Ltd
Donald Walker
Henry Wells - Canadian Consulate General
Mark Wells - US Dept of Commerce
Nathan Wiggers - Brandes Investment Partners

USAEE Student Scholarship Fund

A Call for Support

USAEE is proud to continue its student scholarship fund. Funds are used to cover the cost of registration fees for students attending the annual conference of the USAEE/IAEE. Students must submit a written application and letter from their student advisor requesting that funds be granted. At the Vancouver Conference, eight students qualified to have their conference registration fees waived in an effort to share our conference experience, the field of energy economics and networking opportunities with other students. Further, inviting student participation at our conferences is one of the best mechanisms for recruiting new members to the USAEE.

The 2002 student scholarship fund was generously provided by the support of the following organizations/individuals:

ConocoPhillips
Exxon Mobil Corporation
Andre Plourde

Recognizing the need for interested and qualified graduates, many funding organizations view the program as supporting education as well as recruitment. The USAEE has started its campaign for scholarship funds for the 2003 North American meeting in Mexico City, Mexico, October 19-21. Contributions have ranged from \$50 to \$2500. If you would like to receive information on how your or your company can become a supporter of this program, please contact Dave Williams, USAEE Executive Director at (p) 216-464-2785, (f) 216-464-2768, or usaee@usaee.org

IAEE Website Enhancement Update

In order to keep pace with technical advances on the internet, IAEE's website at www.iaee.org has been redesigned and updated. Visit today and have a look at the improvements available to members and visitors of the site.

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Household Energy Consumption in the United States: Implications in the Growth of Minority Households

By Stephanie J. Battles and Muriel V. Moorhead*

Introduction

According to the most recent U.S. population census, 281 million people live in approximately 107 million households in the United States. Although most of the householders are non-Hispanic white, the 2000 Census results show that the minority populations have experienced rapid growth between 1990 and 2000. Hispanic population (of any race) grew by 58 percent—22.4 million in 1990 growing to 35.3 million in 2000. Non-Hispanic black or African Americans also grew by 16.2 percent. The Asian population grew by 52 percent, growing from 6.6 million in 1990 to 10.1 million in 2000 (U.S. Census 2001). Over the 10-year period, overall population growth in the United States was only 13.2 percent. Recent Census Bureau data show that in 2002, the Hispanic population, for the first time, outnumbered the black population, 38.8 million to 38.3 million—a change once predicted for 2014 (Cohn 2003).

As the U.S. experiences these rapid changes in the demographic mix of the population, the amount of energy used in these diverse households is changing as well. Past studies have demonstrated differences in energy use by households of differing origins—sometimes these differences have been due to cultural factors but most often factors such as income, size of home, type of home, and household size produce these differences.

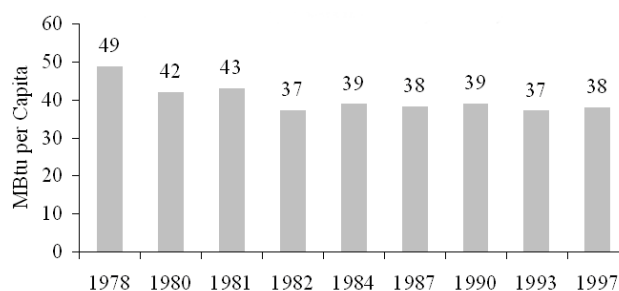
U.S. Census Bureau population projections from 1995 to 2025 show that Hispanic and Asian populations are expected to grow over 100 percent, while the black and non-Hispanic white population will grow by 44 and 8 percent, respectively (Campbell 1996). Overall population is expected to grow by 29 percent. The research presented in this paper uses the Census population projections. Using scenarios of population growth and energy use, the authors estimate growth in U.S. household energy consumption over the 30-year period. The household energy and characteristic data used are the most recent available—data from the 1997 Residential Energy Consumption Survey (RECS), fielded by the Energy Information Administration, the statistical agency within the U.S. Department of Energy.¹ The 2001 RECS energy consumption data were not available at the time of this research.

* Stephanie J. Battles and Muriel V. Moorhead are energy analysts in the Energy Consumption Division within the Energy Information Administration, Wash. D.C. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Energy Information Administration. For questions and other correspondence stephanie.battles@eia.doe.gov.

Research Scenarios

The first scenario in the study assumes energy consumption per capita as a constant at the 1997 level for each population group. Constant per capita household energy use has been rather stable in recent years and, therefore, a constant 1997 per capita consumption may be suitable for this scenario (Figure 1). In this scenario, the population group distribution reflects U.S. Census Bureau 2025 projection while household income growth and stock turnover remains constant.² Under these assumptions, household energy consumption shows a 21 percent growth—growing from 10.5 quadrillion Btu (quads) in 1995 to 12.6 quads in 2025.

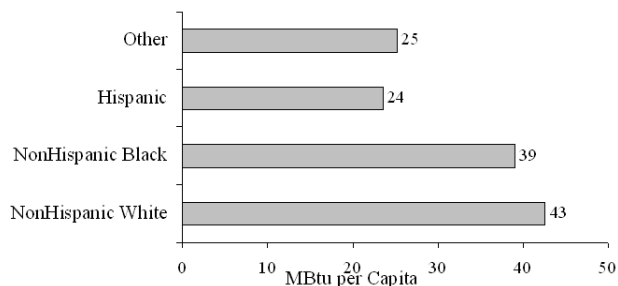
Figure 1
Per Capita Intensity 1978-1976 (Weather Adjusted)



Source: Energy Information Administration, Residential Energy Consumption Surveys

Energy consumption grew faster when we looked at another scenario—one where we assumed that although population grew by 29 percent, the rapid growth in minority households did not take place. In this second scenario, population group distribution was held constant at the 1995 level as well as the 1997 energy per capita consumption as in the first scenario. In this scenario, household energy consumption grew by 28 percent, to 13.5 quads in 2025—7 percent more when the projected population mix remained constant instead. These results are consistent

Figure 2
Per Capita Energy Intensity by Population Groups 1997



Other = Native American, Alaskan

Source: Energy Information Administration, 1997 RECS

with circumstances where minority households use less energy per capita than non-Hispanic white households. Figure 2 assures that this is true--energy intensities are lower for the minority populations.

As mentioned in the introduction, determinants of household energy use may be cultural, however, we do know that there is a strong relationship between income growth and the growth of household energy demand for the major energy sources: electricity, natural gas, fuel oil, and liquefied petroleum gas. As income increases there is a corresponding rise in the demand for new housing, larger housing, number and type of appliances, etc. In light of this, another scenario was considered—one where the minority population group had the same income distribution and per capita consumption as non-Hispanic white households—thus allowing for limited income growth. Under this minority income-growth scenario, total household energy consumption grew by 33 percent—a 57 percent increase in the 21 percent growth under the first scenario where minority per capita energy demand and income growth remained constant.

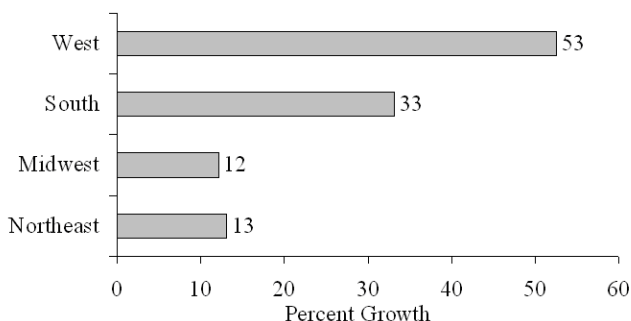
Since factors such as income will not remain static as well as efficiency gains through stock turnover, the growth of total household energy consumption between 1995 and 2025 will most likely be closer to the 33 percent growth—13.7 quads.³

The next section inspects closely the population projections—where most of the growth will be and what are some of the determinants influencing this growth such as immigration, internal migration, fertility, and mortality. Studying the determinants of population growth is important in order to understand the uncertainty surrounding the projections and the consequential uncertainty in the projections of household energy use.

Determinants of Population Growth

As the “baby boomer”⁴ population begins to retire, the Midwest and the South experience the highest percentage growth in elderly population. The South experiences the largest gains in net internal migration with Florida replacing New York as the third most populous State. The new

Figure 3
Projected Population Growth by Census Region,
1995 to 2025



Source: U.S. Bureau of Census, Population Division, PPL-47

retired migrants are wealthier than their ancestors and live longer as life expectancy has increased from 75.9 to 79.1 years.

The South and West Census Regions are projected to experience most of the population growth over the 30-year period (Figure 3). More than one-half of the population growth is projected to take place in the West. California, the fastest growing state, expects to add 8 million international immigrants driving the doubling of its' Hispanic population. Over 60 percent of the growth in the non-Hispanic white and black population is projected for the South Census Region.

One factor, fertility rates, is also adding to the population increases in minority households--especially those households in the South and West. Over the 30-year period of the projection, Hispanic fertility rates are expected to remain stable, but at a high rate of 2.997 children per woman (Table 1). Along with immigration, fertility rates are the driving force behind rapid Hispanic population growth.

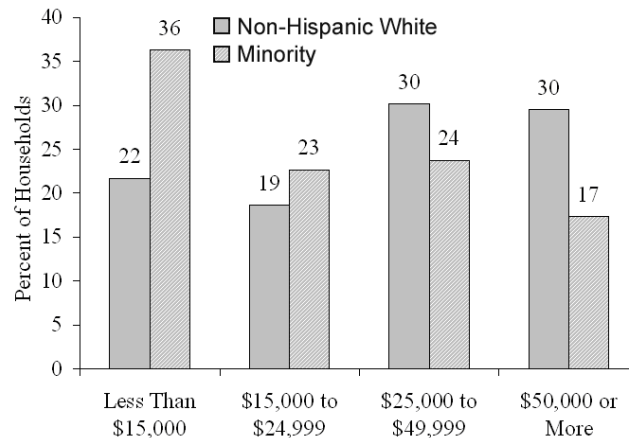
Table 1
Projected Changes in Fertility Rates
(Children per Woman)

Population Group	1995	2025
Non-Hispanic White	1.984	2.116
Non-Hispanic Black	2.427	2.449
Hispanic	2.977	2.977
Asian	1.953	1.948

Source: U.S. Census Bureau, Population Division, PPL-47

As demonstrated in this section, for the most part, minority population increases are behind most of the population projections in the United States and especially behind the projected increases for the South and

Figure 4
Southern Households by Income, 1997



Source: Energy Information Administration, Residential Energy Consumption Survey, 1997.

West—the fastest growing regions of the United States.

Since it is important to understand the effect that differential population growth will have on future household energy demand, it may be useful to explore the determinants of household energy use today. For simplicity sake and to reduce regional effects, only one of the fastest growing regions will be explored in the next section. The South Census Region was chosen, instead of the West, as the number of total households, amount of energy used, and energy intensities are larger in the South. Since there are more households in the South, the RECS sample size is larger thus generating smaller standard errors. Additionally, the weather patterns vary much more over the West Census Region than the South Census Region.

Using the 1997 RECS, selected characteristics of two population groups are compared—non-Hispanic white households and minority households as a group for the characteristic and by individual population groups for the energy intensity comparisons.⁵

Determinants of Energy Demand by Population Groups

Household Income. As income increases so does the demand for household services and thus, energy use. For example, with higher income more appliances and larger homes may be purchased. As seen in Figure 4, a higher proportion of minority households than non-Hispanic white households are in the lower income brackets.

Table 2
Household Energy Consumption in the South by Income (Million Btu per Household)

Income	Non-Hispanic White	Non-Hispanic Black	Hispanic	Other
<\$15,999	67	76	57	86
\$15,000-\$24,999	76	86	64	W
\$25,000-\$49,000	86	85	69	83
\$50,000+	104	110	89	74

W=Withheld

Source: Energy Information Administration, Residential Energy Consumption Survey, 1997

Thirty-six percent of minority households have income of \$15,000 or less while 30 percent of the non-Hispanic white households have incomes greater than \$50,000. Table 2 shows the correlation between income and energy intensity.⁶ With more income, the intensity of energy use increases—although differing levels for each of the population groups. It is interesting to note that even at the

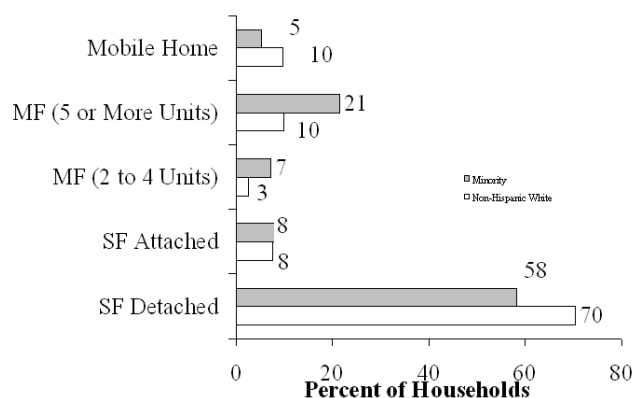
upper income levels, Hispanic households in the South use energy less intensively than their counterparts. In the higher income bracket, non-Hispanic black households seem to use energy more intensively than any other population group. However, in 1997 only 17 percent were in the higher income bracket, but this is growing. Income growth in minority population groups should lead to increases in energy intensity and thus increase energy demand.

Type of Home. Homes in the United States overall, have been getting larger—especially the single-family attached units. Many of these homes now have basements and garages, pushing up the square footage. Changes in housing size and type are placing upward pressures on household energy demand—even though households are more energy-efficient than in the past (EIA, 2003). In the South, the major area of population growth, 78 percent of all non-Hispanic white households live in single-family homes (detached or attached). At the same time, in the South, 64 percent of minority households live in single-family homes and 21 percent live in the large apartment house (Figure 5). All population groups use energy more intensively in the single-family detached home.

It is interesting to note again that non-Hispanic black households use energy more intensively, on average, for each type of housing unit (Table 3). Hispanic households use energy less intensively for each housing type—even the single-family detached home. This may be a reflection of not only the housing type, but also the age of the home or multifamily building, type of heating and/or cooling equipment, appliances, etc.

With income growth, there is the potential for more non-Hispanic black and Hispanic households to move into detached-single family homes, placing upward pressures on energy demand—with higher increases in non-Hispanic black households than in Hispanic households.

Figure 5
Southern Households by Housing Type, 1997



Source: Energy Information Administration, Residential Energy Consumption Survey, 1997

Household Ownership and Household Size. Almost 80 percent of non-Hispanic white householders in the South own their own home while only 57 percent

Table 3
Household Energy Consumption in the South
By Housing Type, 1997 (Million Btu per House-
hold)

Housing Unit	Non-Hispanic White	Non-Hispanic Black	Hispanic	Other
Single-Family				
De-tached	98	100	88	105
Attached	61	97	55	77
Multifamily				
2 to 4 units	58	61	48	38
5 or More Units	37	49	40	42
Mobile Home				
	69	74	75	64

Source: Energy Information Administration, Residential Energy Consumption Survey, 1997.

of minority householders own theirs. Most of the rental housing is smaller multifamily dwellings with lower energy intensities—especially if the intensity measured is energy per square foot. Non-Hispanic black homeowner's energy intensity is the highest at an average of 103 Mbtu whereas the Hispanic homeowners have an average of 84 Mbtu while non-Hispanic homeowners' average intensity is 91 Mbtu. As homeownership increases for minority households upward pressures will be placed on energy demand.

Minority households do have more household members than non-Hispanic white households—especially the Hispanic household. In the South, 63 percent of non-Hispanic households have one or two members whereas only 42 percent of Hispanic households have the smaller household. Again, however, Hispanic household use is less energy intensive than the other population groups for each household size grouping—possibly moderating growth in energy demand.

Summary and Conclusions

Population projections as well as energy forecasts are uncertain. This paper's goal is to present the reader with a sense of what are the major determinants of population growth and energy demand in an uncertain environment. It was found that if the growth in the population mix does take place, holding all other major determinants constant as best as we could without a major modeling effort, then energy consumption may increase by 21 percent over the 30-year period, 1995 to 2025. If we assumed that the population mix would remain the same, i.e., slowdown

of immigration or a reduction in fertility rates for minority households, energy consumption was projected to be higher at 28 percent.

Since we can assume that minority households' income will indeed experience growth in the future, income growth was incorporated into a third scenario and energy consumption was projected to grow even more—33 percent.

As seen in this paper, Hispanic households do react and use energy more intensely as incomes rise, but not as much as non-Hispanic white households. Non-Hispanic black households seem to use energy more intensely than non-Hispanic white households as income rises.

Using a very detailed national survey such as the RECS, these differences need to be explored in depth—possibly looking at other consumption behaviors, household characteristics, and housing unit characteristics such as the usage of appliances, appliances purchases, age of appliances, and age of home. Studies such as this are limited by the difficulty of modeling, but are very important in projecting energy demand.

Human behavior is extremely difficult to model and provides the major uncertainties in our models and projections. Hispanic households could alter their behavior and bring their per-household energy use more in line with that of other population groups. The combination of rapid Hispanic population and income growth with an increase in home ownership, especially of single-family housing, could drive a more rapid increase in U.S. household energy use than is projected in the scenarios given in this paper.

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U.S. Natural Gas Markets in Turmoil*

By Stephen P. A. Brown**

This testimony focuses on the potential crisis stemming from a natural gas supply shortage, which has more than doubled spot natural gas prices during the past year. Further, it addresses why natural gas prices have risen sharply, the outlook for natural gas prices, and some of the implications for the U.S. economy.

Inventories: One Key to Understanding Natural Gas Prices

Sharply rising prices are always the consequence of demand expanding more than supply or supply contracting more than demand. In the case of natural gas, the analysis is complicated by strong seasonal patterns in consumption and a very mild seasonality in production. U.S. natural gas consumption is nearly double in January what it is in May and June. Unusually cold winter weather or unusually warm summer weather can further accentuate seasonal patterns.

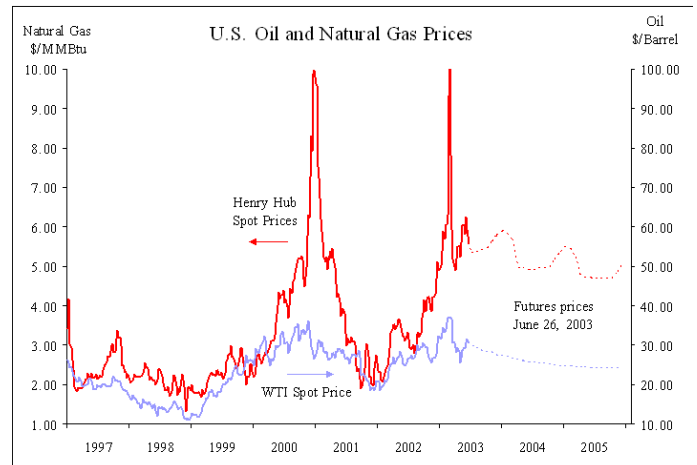
In a market with sharp swings in consumption, inventories play an important role. In an average year, natural gas consumption exceeds production and imports in November, December, January, February and March. During those months, current production, imports *and* inventories are typically used to meet consumption. During the average year, inventories are built during the months of May, June, July, August, September and October, when natural gas production and imports typically exceed consumption.

Consequently, swings in inventories are one key to understanding movements in natural gas prices. When inventories fall below normal averages for a given month, natural gas is seen as relatively more scarce, and its price rises. When inventories rise above normal averages for a given month, natural gas is seen as relatively more plentiful, and its price falls.

Oil Prices: Another Factor in Natural Gas Prices

For some industries and electric utilities, natural gas and residual fuel oil (a petroleum product) are good substitutes. Although declining in number, these energy users are able to switch back and forth between these fuels quickly, depending upon which is cheaper. Rising oil prices push these energy users toward natural gas, and falling oil prices attracts them back to residual fuel oil. Consequently, economic research finds that oil and

natural gas prices have tended to track each other over long periods of time (See Chart 1).



Volatile Natural Gas Prices

In winter 2000-01, two factors contributed to sharply rising natural gas prices. In the West, there was a drought that reduced hydroelectric power. Other parts of the United States had colder than normal winter weather. Both contributed to a surge in natural gas demand. In many parts of the country, the additional natural gas was used to heat homes and businesses. In the West, it was used to generate electricity. The surge in natural gas demand led to a sharp reduction in natural gas inventories, and its price rose sharply—with the spot price averaging more than \$8.50 per million Btu in January 2001.

In subsequent months, natural gas production was increased, mild weather and weakening economic activity contributed to falling natural gas demand, and inventories were swiftly rebuilt. By December 2001, inventories were at a five-year high.¹ The spot price of natural gas was just over \$2 per million Btu. Throughout 2002, inventories varied seasonally but remained at the high end of their five-year average.

During 2002, oil prices began to rise. Oil production was disrupted in Venezuela. Tension in the Middle East began to escalate. Rising oil prices prompted some electric utilities and industrial energy users to switch from residual fuel oil to natural gas, which boosted natural gas consumption and pushed natural gas prices upward—even though natural gas inventories remained very high.²

During winter 2002-03, continued increases in oil prices, colder than normal weather and a recovering economy contributed to stronger than anticipated gains in natural gas demand. At about the same time, natural gas production slipped below expectations. Natural gas fields that were made economically feasible with newer technology proved to have sharper decline rates than had been expected. Although we had approached winter with high natural gas inventories, they were used quickly and fell to five-year lows by March 2003. Natural gas prices rose sharply.

* Testimony Prepared for a Hearing on The Scientific Inventory of Oil and Gas Resources on Federal Lands organized by the Subcommittee on Energy and Mineral Resources, Committee on Resources, U.S. House of Representatives on Thursday, June 19, 2003

** The views expressed are solely those of the author and do not necessarily represent those of the Federal Reserve Bank of Dallas or the Federal Reserve System.

The Near-Term Outlook for Natural Gas Prices

While rising in late 2002 and 2003 natural gas prices decoupled from oil prices. That is, natural gas prices pulled away from their historical relationship with oil prices. One old rule of thumb is that the spot price of natural gas at Henry Hub (a delivery point in Louisiana) is roughly \$1 per million Btu for each \$10 per barrel of oil for the spot price West Texas Intermediate crude oil (WTI). By this rule, the current price of about \$30 per barrel for WTI would imply a price of about \$3 per million Btu for natural gas at Henry Hub. The current spot price at Henry Hub is in excess of \$6 per million Btu.

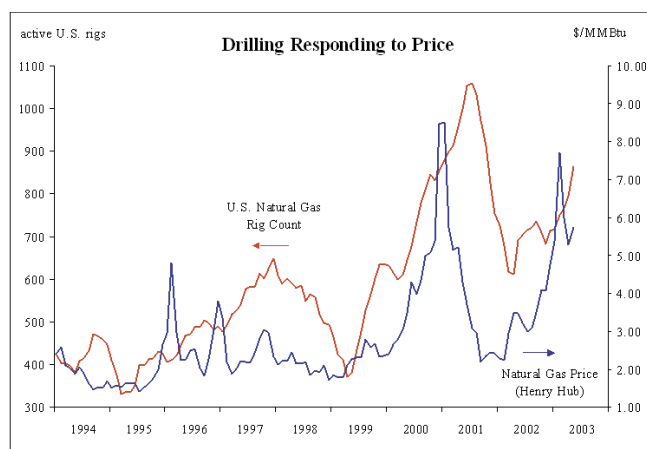
Although natural gas prices decoupled from oil prices for about a year during 2000-01, the current outlook is that natural gas prices will remain substantially high in comparison to oil prices. Futures markets for these two fuels show expectations of a continued decoupling of natural gas and oil prices through year-end 2005. Inventories are being rebuilt, but they are only keeping pace with normal seasonal growth and remain below the five-year average for June.³ Although drilling for natural gas is responding to higher prices, domestic production and imports have been insufficient to rebuild inventories to normal seasonal levels, and increases in domestic production are not expected to enable inventory rebuilding (See Chart 2).

Over the next few years, the prospects for lower natural gas prices depend largely upon an unseasonably cool summer or unseasonably warm winter, but a lack of offshore production shutdowns in the Gulf of Mexico during the fall hurricane season also could soften price pressures. Imports from Canada are constrained by the current extent of resource development in that country and pipeline capacity. Imports of Liquefied Natural Gas (LNG) have risen sharply, but substantial growth is limited by a lack of U.S. LNG terminal facilities.

The Longer-Term Outlook for Natural Gas Prices

Over the longer-term, analysts expect natural gas demand to expand more rapidly than that for other fuel sources.⁴ In comparison to other fuels, natural gas is seen as environmentally desirable because it burns cleaner. Without adequate development of domestic natural gas resources and additional imports, rising demand for natural gas will continue to keep natural gas prices elevated relative to those for oil. Consequently, the decoupling of natural gas and petroleum prices could persist.⁵

Development of domestic resources may require better access to public lands and the development of new pipeline capacity from remote locations to markets. Increased natural gas imports from Canada will require the exploration and development of remote fields not yet in use and transportation through pipelines that are not yet constructed. Increased imports of LNG will require the development of additional terminal facilities beyond the



current four (in Georgia, Louisiana, Massachusetts, and Maryland) that currently serve the entire United States.

Cheniere Energy, Inc. of Houston has announced plans to build two new LNG terminals in Texas and one new terminal in Louisiana. Imports at these Gulf Coast facilities will contribute to overall supply of natural gas in the United States, but will depend on existing pipelines to reach end use markets in other parts of the country. Some companies are also considering the development of an LNG terminal in Baja California, Mexico that could be used to import natural gas from South America into California. A terminal serving the West Coast could greatly relieve some of the pressure on natural gas prices in the California market.

In further developing our domestic natural gas resources and our ability to import additional natural gas supplies, we face important environmental issues. Natural gas is an environmentally desirable source of fuel, but additional development and imports may have some environmental consequences.

Economic Consequences of High Natural Gas Prices

Sustained high natural gas prices are likely a drag on U.S. economic activity. Higher energy prices are indicative of increased scarcity of natural gas which is a basic input to production.⁶ As such, rising natural gas prices can result in a classic supply-side shock that reduces potential output. Consequently, output and productivity growth are slowed. The decline in productivity growth lessens real wage growth and increases the unemployment rate at which inflation accelerates.⁷ If market participants expect the near-term effects on output to be greater than the long-term effects, they will attempt to smooth their consumption by saving less or borrowing more, which boosts the interest rate. With slowing output growth and an increase in the real interest rate, the demand for real cash balances falls, and for a given rate of growth in the monetary aggregate, the rate of inflation increases. Therefore, rising natural gas prices reduce GDP growth and boost real interest rates and the measured rate of inflation.⁸

To my knowledge, no research that has been through peer review has quantified the effects of rising natural gas prices on U.S. economic activity. A considerable body of research has addressed the economic effects of higher oil prices.⁹ That research can be adapted to provide a rough approximation of the economic effects of rising natural gas prices.

During previous oil price shocks, natural gas and oil prices have generally moved together. Prices for other primary energy sources were relatively unchanged. Consequently, the measured effects of oil price shocks may represent the combined effects of both oil and natural gas price movements. Natural gas accounts for about 40 percent of total oil and natural gas consumption, so 40 percent of the measured effect of an oil price shock may be a rough approximation of the effect of a natural gas price shock by itself. On that basis, a rough estimate is that a sustained doubling of natural gas prices would reduce U.S. GDP by 0.6 to 2.1 percent below what it would otherwise be.¹⁰ The increase in the GDP deflator would be about the same.

The economic effects of higher natural gas prices are likely to be uneven across industries and regions of the country.¹¹ States with extensive natural gas fields will benefit from rising natural gas prices, while states with industries that use natural gas extensively will be hurt. Among the domestic industries most adversely affected by rising natural gas prices are fertilizer producers, the petrochemical industry, electric utilities, aluminum producers and the users of these goods and services.¹²

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Notes

1. See the Energy Information Administration's "Weekly Natural Gas Storage Report."

2. The ability to switch between natural gas and residual fuel oil is declining.

3. Natural gas inventories have remained below the five-year seasonal average for each month since March 2003.

4. For example, see the U.S. Energy Information Administration's *Annual Energy Outlook 2003*.

5. Although the imposition of price controls for natural gas could keep natural gas prices in line with those of oil, such controls would exacerbate the shortage rather than alleviate it. See Brown 1985 and Brown and Yücel (1993).

6. See Brown and Wolk (2000).

7. Reduced productivity would reduce profits and expected future profits which will reduce stock prices and wealth.

8. See Brown and Yücel (2002).

9. For surveys on the research about the aggregate economic response to oil price shocks, see Brown and Yücel (2002) and Brown, Yücel and Thompson (forthcoming).

10. A 1987 Energy Modeling Forum study (Hickman et al. 1987) estimated the elasticity of the response to the U.S. economy to an oil price shock as -0.02 to -0.076. Brown and Yücel (1995) find it likely that the elasticity of response to an oil price shock has declined since the 1980s. About 70 percent of petroleum is consumed in transportation, while 75 percent of natural gas is consumed directly by industry, electric utilities and commercial establishments, which has led some analysts to suggest that movements in natural gas prices could have greater economic effects than movements in oil prices alone. Rising oil prices result in substantial income transfers from the United States to oil-exporting nations, but rising natural gas prices do not result in similar transfers. To the extent that these transfers affect economic activity, the economic consequences of

(continued on page 35)

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Managing the New Transparency: Cultural and Organizational Considerations

By Mary-Ellen Boyle

In the post-Enron world of business conduct, transparency has become a fashionable catchword, with several meanings. This new transparency is especially consequential for the energy industry, as it faces economic, political, and ethical uncertainties around the world. For global firms, managing transparency across cultures is both necessary and difficult. This article explores the evolving meanings of transparency, outlines managerial responses, and explains how cultural characteristics can be incorporated into transparency management.

The Multiple Meanings of Transparency

Transparency in business transactions was once simply associated with anti-bribery and anti-corruption efforts. It meant that financial transactions should be visible and accounted for; that is, no hidden payments. Transparency of this type has been encouraged by laws (the Foreign Corrupt Practices Act in the US, a similar law in Britain), as well as the voluntary guidelines of various international organizations (OECD, OAS, World Bank, European Union) (Getz 2000). Non-governmental organizations also play a role, significantly Transparency International (TI), established in 1993. TI fights corruption primarily through information: it researches and publishes an annual Global Corruption report, a Bribe Payers Index, a Corruption Perceptions Index, and source books for creating National Integrity Systems. Industry-specific efforts also exist: in 2002 the British government initiated the Extractive Industries Transparency Initiative, which encourages voluntary disclosure of facilitating payments.

Recently, transparency has come to refer to the unambiguous reporting of financial transactions, not just those related to corruption or bribery. Corporations have always been required to publish financial data, but the new transparency expects more, and data must be understandable and available to the layperson. Financial disclosure is a concern of the US Sarbanes-Oxley Act of 2002, and subsequent SEC and NYSE rulings. In addition to financial disclosure, companies are also being pressed to report on their social and environmental/sustainability activities. Almost 60% of the 200 largest industrial multinationals publish a sustainability report, many addressing societal issues as well (Kalk 2002). Several groups are vying to supply the social and sustainability reporting standards, with as yet no consensus. In this second category, transparency, whether related to financial, social, or environmental issues (the triple bottom line), is made evident through reports, usually available free online.

In its broadest definition, transparency has been discussed as the tenth principle of the United Nations Global Compact. The Global Compact is a voluntary

initiative that aims to bring corporations together with UN agencies, labor, and civil society groups to support human rights, labor and environmental principles. Hundreds of companies and agencies currently participate. In late 2002, a proposal was made to add transparency to the existing principles. Transparency here is defined as, "accountability, integrity, and responsibility," and "should be more broadly oriented than a simple anti-corruption or anti-bribery measure" (Waddock 2003:4). Since the Global Compact is controversial, it is possible that this broad meaning of transparency will not become commonly accepted. Nonetheless, managers should be aware of it, especially if they are dealing with organizations that are Global Compact signatories.

So, in this "era of transparency," the word has come to have multiple, increasingly wide-ranging meanings: anti-bribery and anti-corruption; disclosure of financial, social, and environmental activities; and accountability, integrity, and responsibility. These three categories are not mutually exclusive, nor are the meanings synonymous. The manager's first task is to clarify the meaning of transparency in any particular situation.

Managing the New Transparency

The new transparency brings a predictable range of challenges. All three categories are expensive, with disclosure carrying the highest direct costs because of the requirements of public reporting and necessary adjustments to information technology. In addition to the economic and technical matters, managers will have to deal with general organizational issues.

First, *managing transparency requires knowledge*. Transparency International states, "The effective use of knowledge is perhaps the most potent of all the weapons we can use in the fight against corruption." Knowledge should concern the law and corporate expectations, and should extend to understanding the possibility of inducements to corruption in a particular nation. For example, employees responsible for international procurement can check a country's score on the Bribe Payers Index, learn about business exchange norms in the country, and be prepared act accordingly. Second, employees need knowledge if they are to disclose financial and social data, and will require specific information as to what they cannot disclose, in order to avoid security and trade secret risks. Third, regarding the broadest category, employees will need to become knowledgeable about the meanings of integrity, accountability, and responsibility, and must be taught how to turn their knowledge into acceptable behavior. In trying to bring about transparency broadly construed, managers can rely upon established research in the business ethics field (Paine 1994; Trevino et al 1999; NBES 2003; Weaver 2002). Researchers assert that "what works" in organizations seeking integrity is knowledge about ethical behavior, an ethical work climate, and formal structures for moral support (ethics programs). Organizational leadership must be committed to these values and visibly

supportive of programmatic efforts.¹

Therefore, *managing transparency requires formal ethics programs and leadership committed to transparency.* Company programs typically include values statements, written standards of conduct, ethics training, ethics advice lines/offices, performance measures, and systems for anonymous reporting. Responsibility for these programs is often given to one person, referred to as an ethics or compliance officer. Leadership goes beyond the ethics officer, however. Senior managers must act ethically, too, defined as talking about the importance of ethics, informing employees about expectations, keeping promises, and modeling ethical behavior (NBES 2003). Any gap between leadership rhetoric and behavior is observed and resented by employees, so top management and direct supervisors must act with integrity.

Ethics programs address the three categories of transparency in straightforward ways. Programs tackle bribery by including it in the code of conduct, addressing it in training, and rewarding/punishing employees and managers for efforts in this area. Transparency International can supply materials for education on these topics. Senior executives can exhibit their anti-corruption values both within the company and outside, through active involvement in global efforts to address these issues. Secondly, with regard to various types of disclosure, ethics programs and top management can assure that disclosure is not simply treated in a legal manner, but becomes a value in and of itself. Training sessions and hotlines can answer concerns about proprietary information and privacy. When transparency is defined broadly (as integrity, accountability, and responsibility), leadership and other moral support structures will be needed to define, communicate, and reward desired behavior.

Research has identified two different approaches to ethics within organizations: a values/integrity approach, and a rules/compliance orientation. Firms that take a values approach expect employees to aspire to high standards of ethical behavior, and rely on ethical leadership and a culture of integrity to inspire workers and managers. Rules-based programs emphasize legal compliance rather than ethical principles. Neither approach is faultless: values-based programs can suffer from vagueness, while compliance can be interpreted too narrowly and leave employees without guidance in ambiguous or new situations. While evaluation of formal ethics programs is scant and based largely on US firms, researchers assert that an effective ethics program needs to emphasize both values and compliance. The multiple definitions of the new transparency also suggest a combination of compliance and values: specific rules can be made concerning bribery and disclosure, while it is impossible to codify “accountability, integrity, and responsibility.” National culture can influence propensities of employees to respond to rules over values, as will be detailed in next section.

Additionally, *managing transparency requires open communication, empowerment, and trust.* Open communication is that which transcends organizational

levels, crosses departments, can take place without fear of negative repercussion, and allows opportunity for anonymity as necessary. Employees must feel free to discuss bribery attempts and suspected corruption and the company must encourage whistle blowing and provide safe mechanisms for doing so. Whistle blowers gained added protection under the Sarbanes-Oxley Act, and while public whistle blowing may not be the ideal way to handle negative information, conditions should be created so that employees are at ease communicating potentially bad news to insiders who will make changes, and employees need well-publicized mechanisms to blow the whistle externally should internal efforts be unsuccessful. The expected behaviors need to be modeled and rewarded, especially difficult in organizations that are hierarchical and where employees are unused to having a voice. For disclosure, open communication must be supplemented by organizational arrangements that can obtain the information needed to complete reports and surveys. (These demands for information can be so great that an INSEAD conference warns of “questionnaire fatigue.”) The disclosure/reporting process will inevitably result in unfavorable information, and employees must clearly understand how and to who they are to communicate negative findings. Empowerment means giving people decision-making power and encouraging them to use their knowledge, experience and internal motivation. Employees at all levels must feel empowered to speak about their concerns and act accordingly, and must trust that their questions will be heard and that there will be no negative personal repercussions. Open communication is also required to put boundaries on “accountability, integrity, and responsibility,” and assure that meanings are shared. In all three of the categories of transparency, language skills become fundamental, rather than optional, and cross-cultural understanding is essential. Open communication is premised upon empowerment and trust.

In conclusion, effective management of the new transparency, however defined, requires knowledge, formal programs and leadership, and open communication, empowerment and trust. Many companies have already instituted some or all of these, and are working on transparency in several of its manifestations. What is new are the requirements and scope of Sarbanes-Oxley Act and subsequent interpretations by the NYSE and the SEC, rulings that often extend to non-US based companies; also new is the scrutiny from NGOs, governments, media, shareholders and customers, shareholders, and employees. Perhaps most important, the global reach of the transparency efforts is heretofore unheard of. Consequently, the remainder of the article will focus on implementing transparency in international settings.

National Cultural and Transparency

National culture can influence psychology and actions, as management theorists Sethi and Steidlmeier assert, “No matter how much business might yearn for the unfettered

marketplace, there is no business person or institution whose very aspirations and behavior are not governed by the internal gyroscope of society's values and culture" (1995:9). When it comes to business ethics and corporate social responsibility, the role of national culture has long been controversial. The debate centers on the issue of universal ethical principles as opposed to norms relative to a particular culture, and the question of whether one culture should impose its beliefs on another or should adapt to local conditions. Current thinking suggests rejecting both extremes of ethical relativity and cultural imperialism, implementing instead a hybrid strategy based upon a few universal principles and recognition of cultural differences in enacting these universals (Donaldson & Dunfee 1999; Logsdon & Wood 2002). When it comes to bribery, for example, there is global agreement that it is ethically objectionable (and illegal nearly everywhere). Prohibitions against bribery, however, must be implemented in ways that take into account cultural differences (Husted 2002). In the US, this may mean the creation of written rules and regulations, while another culture might rely on respected elders to communicate the expected behavior. The hybrid strategy requires deep understanding of cultural differences and savvy uses of cultural characteristics to bring about corporate objectives.

Cultures vary in innumerable ways, and international business researchers do not agree on either the full range of relevant cultural characteristics or the most salient few. Relying upon the work of Hofstede (2001), this article will analyze three dimensions—individualism, power distance, and uncertainty – each well-researched and related to transparency. Hofstede scores and ranks countries along these dimensions. Despite the validity and reliability of his research, it is dangerous to overly rely on the generalizations, and to make judgments as to better or worse. There are wide ranges of behavior within countries, especially as nations become more diverse, and rankings on the dimensions are just averages. Individuals have their own cognitive styles and levels of moral development, further complicating

the picture. Nonetheless “understanding the internal gyroscope” is crucial to international managers, if considered carefully.

Individualism and Collectivism

Individualism is defined as reliance on individual initiative and personal responsibility, while collectivism gives primacy to the group, whether it is the family, community, or workplace in-group. Countries that score high on individualism include the US, Australia, Great Britain, Denmark, Sweden, Italy, France, and Norway. Table 1 details individualism and its influence on transparency. Collectivistic countries include Israel, Japan, Brazil, China, and other Latin and Asian nations. Table 2 describes characteristics and consequences.

Interactions between individualistic and collectivistic cultures can be difficult. Based on what is known about knowledge transfer, communication about transparency will be most effective if it occurs between similar cultures. This poses particular problems for MNCs, whose headquarters are typically in individualistic countries and who often have field operations in non-individualistic nations. In such cases, it is essential to employ local interpreters with knowledge of cultural differences, and to use respected in-group members. Preference for tacit rather than explicit information also typifies collectivistic cultures, and complicates disclosure efforts. It may be possible to override this tendency by teaching employees about the differences between tacit and explicit knowledge, and explaining the benefits of the disclosure requirement to the group.

Table 1
Individualism and Transparency

Research Findings³	Managerial Consequences
The relationship of the individual to the organization is calculative (e.g. “What’s in it for me?”); personal goals matter.	<ul style="list-style-type: none"> • Ethics program can be values-based, if the values appeal to individuals and their self-interest.
Employees do not want to be accountable for results that depend on work of others.	<ul style="list-style-type: none"> • Transparency efforts should stress individual responsibility & consequences. • Disclosure practices should clearly allocate responsibility.
Written and codified information is highly valued.	<ul style="list-style-type: none"> • Rules-based ethics programs may be effective. • Codes of conduct, disclosure requirements, & bribery policies should be well documented.
Explicit, logical, abstract knowledge transfers best.	<ul style="list-style-type: none"> • Training should emphasize rationality and abstract ideas like truth, fairness.
Propensity to trust and external trust are high	<ul style="list-style-type: none"> • Individual whistle blowing can be encouraged and expected.

Power Distance

Although individualism and collectivism are considered foundational cultural characteristics, they do not exist alone. Attitudes towards hierarchy and authority are also important, particularly within workplaces. Power

of transparency that depend upon people willing to make decisions and take responsibility will be inhibited in such environments. This has particular implications for whistle-blowing, especially if people are expected to disregard the chain of command². Furthermore, power distance is the cultural dimension most related to the perception of

Table 2
Collectivism and Transparency

Research Findings	Managerial Consequences
Relationship of individual and organization is moral (like a family). <ul style="list-style-type: none"> • “Self” functions interdependently. • Collective goals take priority. 	<ul style="list-style-type: none"> • Stress stewardship obligations (in addition to financial duties) of corporation. • Ethics programs can be values-based if the values are collective. • Values statements should mention the group, company, family, society
Individuals trust in-groups rather than out-groups.	<ul style="list-style-type: none"> • Frame corrupt practices as a violation of the in-group; emphasize in-group benefits of transparency. • Consultants and external monitors can expect little rapport or collaboration; relationships must be nurtured over the long term.
Codified information is not esteemed in and of itself.	<ul style="list-style-type: none"> • Rules can be effective if communicated by respected organizational leaders.
People respond to information about organizational history, patterns of obligations, in-groups and out-groups. Contextual clues are important.	<ul style="list-style-type: none"> • Codes of conduct should include historical, contextual information • Communications about transparency should avoid abstractions • Offer information about how the company treated bribery or disclosure historically. • Explain how the expected changes fit into already established duties.
Employees are better at absorbing knowledge that is tacit and systemic.	<ul style="list-style-type: none"> • Use cases, examples to teach. Avoid abstractions. • Create situations where employees can learn from relationships
People do not like to stand out from the group, and are uncomfortable with individual responsibility.	<ul style="list-style-type: none"> • Emphasize the importance of transparency to the collective; focus on the team effort. • Create mechanisms for team/group whistle-blowing • Expect whistle blowing to be indirect (if it occurs at all)
Relatives are preferred in hiring.	<ul style="list-style-type: none"> • Procedures should be put in place for hiring and working with relatives

distance refers to “the extent to which the less powerful ... expect and accept that power is distributed unequally.” Differences in power distance need not inhibit the new transparency, though the managerial challenges posed are considerable.

Countries with high power distance are Malaysia, Panama, Philippines, Mexico, Venezuela, Arab countries, and West Africa. Empowerment, obviously, will be difficult where power distance is great, and therefore the aspects

corruption and its eradication, because people in such cultures do not like to think badly of their leaders (Husted 1999). Additional consequences are outlined in Table 3.

Conversely, in countries like Sweden, Denmark, Austria, Germany, Great Britain, Costa Rica, Australia, and Israel, power distance is low, and implications for transparency are the opposite from those in Table 3. Of greatest consequence is the diffuse nature of accountability. Usually these cultures are typified by a sense of equality

Table 3
High Power Distance and Transparency

Research Findings	Managerial Consequences
<ul style="list-style-type: none"> Communication is top-down. Employees are discouraged from questioning authority. Managers doubt employees have useful information. Powerful leaders are needed to implement changes. 	<ul style="list-style-type: none"> Transparency expectations must be communicated by those with hierarchical authority. Employees will not expect input into values statement or code. Training programs should acknowledge the power of the hierarchy & try to encourage responsibility from those at lower levels.
Decisions are centralized.	Managers must have the technical abilities to make decisions.
Managers and employees rely on rules.	Ethics programs should be rule-based & include mechanisms for centralized decisions.
<ul style="list-style-type: none"> Responsibility is resisted by those low in the hierarchy. Grievance channels are difficult to establish. 	<ul style="list-style-type: none"> Whistle blowing will be difficult; can be modeled by powerful leaders. Whistle blowing procedures should respect the authority structure and allow managerial deference. Training about whistle-blowing should explicitly address fears of challenging authority and the consequences of such.

and informality, and such attitudes can make accountability elusive, suggesting extra efforts must be made to clarify the importance of the transparency issues, and to outline individual consequences if indeed not all will be treated equally. Flatter organizations can also inhibit information flow if there are not adequate integrating mechanisms, so managers should consider the use of liaisons, task forces, etc. in order to assure effective communication.

The US ranks moderately on power distance, and expectations about hierarchy and open communication

are somewhat malleable. This implies that US managers should examine their own expectations about power sharing, and determine the extent to which there is congruence with cultural norms. When power distance is combined with individualism or collectivism, the picture gets more complex. Collectivism is usually accompanied by large power distances, but not always. Therefore, research has conceptualized vertical and horizontal dimensions to collectivism and individualism (Triandis 1995). Knowledge transfer increases in difficulty depending

Table 4
Consequences of Combined Cultural Dimensions

	Vertical Individualism	Horizontal Individualism	Vertical Collectivism	Horizontal Collectivism
Whistle blowing Examples	US, France, Germany, Britain	Denmark, Australia, Finland	China, India, Brazil, much of Africa, the Arab countries	Israel, Japan
Whistle blowing Values	Competition, excellence	Social justice	Hierarchical relationships and the group strength	Social equality
Whistle blowing	Encouraged and expected; investigations assure it is not motivated by personal gain	People do not like to stand out. Anonymous mechanisms needed.	OK to stand out, but must benefit the group	May occur when the group agrees; cannot harm an individual group member

upon whether cultures differ along one or two dimensions, so implementation of transparency programs must take the degree of difference into account. The interaction of the two cultural characteristics changes several of the conclusions derived earlier concerning whistle blowing, and clarifies the values that should inform transparency efforts. These conclusions are summarized in Table 4.

Uncertainty Avoidance

Uncertainty avoidance is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations.” Uncertainty avoidance is inherently tied to the idea of transparency, since by definition transparency aims to diminish ambiguity and opacity in favor of certainty and clarity. Managers should be cognizant of the tolerance for uncertainty among their employees, and reduce or embrace the unknown as appropriate. Cultures that score high on uncertainty avoidance prefer structure, security and organization, as in Germany, Greece, Portugal, Japan, and Argentina (among others). With regard to corruption, disclosure, and integrity, people in these cultures will prefer to be given a great deal of information, since knowledge diminishes the anxiety associated with uncertainty. Further, employees may not be willing to risk exposing negative information or may avoid responsibility unless it is clearly defined.

Where uncertainty is avoided:

1. Values statements are not powerful (but necessary anyway).
2. Codes of conduct should be explicit; explain consequences.
3. Ethics programs should be rules-based.
4. Whistle blowing procedures should be codified and whistle blowers overtly protected and rewarded.
5. Training should be provided by recognized experts.

Cultures where uncertainty avoidance is low may not be especially motivated to achieve transparency in any of its definitions, unless it is framed in terms of other desirable cultural values. Individuals in such cultures may embrace ambiguity while preferring to avoid being pinned down with definite responsibilities. Ranking low in uncertainty avoidance are Singapore, Hong Kong, Denmark, Great Britain, Ireland, India, Sweden, and South Africa. The US is moderately low. This means that employees in these countries can accept lack of certainty that comes with new information, will welcome a consultative management style, and may embrace freedom and avoid responsibility. Where uncertainty avoidance is low, knowledge transfer and communication can acknowledge the “gray areas” that are unavoidable in ethics, but direction must be provided on specific issues related to transparency. The risk is that people will tolerate a lack of clarity that can lead to bad decisions. The factual nature of disclosure will pose a particular challenge – ambiguity is not welcome by

the governing bodies and external monitors that review disclosure documentation. Additionally, where ambiguity is not avoided:

1. Values statements will be readily accepted
2. Usefulness of codes of conduct should be emphasized
3. Ethics programs can be value-based
4. Whistle-blowing can be expected if encouraged
5. Communication can acknowledge uncertainty; should discuss limits of accountability.

The Art and Science of Managing Transparency

In conclusion, what may seem fundamental and logical in one culture, may not be so to another. Indeed, “Nationality constrains rationality,” (Hofstede 2001:381). The research summarized above should tame some of the complexity associated with managing transparency across cultures. At the same time, the manager must be willing to disregard these findings if they do not reflect the reality of the organization under scrutiny, and managers must be aware of additional cultural differences in a particular setting. There is no simple equation, and the evolving nature of transparency itself adds to the management challenges. While this may be frustrating, the global manager who approaches the management of transparency as both an art and a science can increase trust, improve the reputation of the multinational firm, and enhance productivity and effectiveness.

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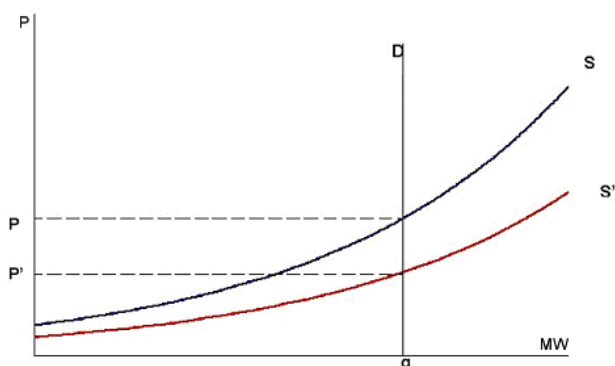
Economic Displacement Opportunities in Southeastern Power Markets

By David E. Dismukes and Dmitry V. Mesyanzhinov¹

Introduction

Efficiency improvements associated with wholesale competition was arguably one of the earliest and most powerfully motivating arguments for moving forward with electric restructuring. Like so many other places around the U.S., independent power generators have been interested in southeast primarily because of the competitive opportunities to beat out older, oil and gas fired steam generation facilities that are currently owned by regulated, vertically integrated utilities. The competitive implications of this displacement is a tendency to lower the regional wholesale supply curve, and for a fixed level of demand, a reduction in overall regional wholesale prices. An example

Figure 1



Hypothetical Example of Efficiency Enhancing Opportunities of Competitive Generation Markets

of this effect has been provided in Figure 1.

One may ask that if these benefits are so obvious, what is preventing them from occurring? To a certain extent, customers in the southeast (as well as other parts of the country) have already seen some benefits associated with these lower cost independent power resources. The sheer abundance of these resources has helped lower regional power prices to very competitive levels in many parts of the country. Yet as many IPPs would be quick to note, there are still a number of barriers that prevent the complete realization of these benefits. Some of the primary constraints limiting the benefits of wholesale competition are associated with transmission, reliability, and market structure.

Transmission Constraints: Electric power is moved over a host of high voltage power transmission lines that have traditionally linked generation to load centers. This complex system of intertwined lines has been developed over several decades under a traditional regulatory framework. As these lines were being developed, there

were few commercial transactions between utilities (i.e., wholesale power trades). The linkages between utilities were traditionally developed for the purpose of reliability – namely, having the ability to temporarily pull generation resources from a neighboring utility system should there be an unanticipated surge in demand or generation outage. Some commercial transactions did take place, but were generally limited in nature.

Since the passage of Order 888, the transmission system in the U.S., has been asked to move an ever increasing share of electricity in wholesale, for-profit, commerce. While this new system of wholesale power commerce has created significant opportunities for consumers, it has also put an increasing amount of physical pressure on a system that was not entirely designed for widespread commercial purposes. Transmission limitations have resulted in several instances where lines have become “tied-up” and unable to move electricity engaged in interstate commerce. These constraints limit the opportunity to access lower cost resources, even within a single state. As a result, customers may have to be served by a higher cost local generation resource that is not subject to the transmission constraint.

Reliability Constraints: Another common and practical problem that can limit opportunities associated with wholesale power can be constraints associated with trying to maintain a reliable and stable electric power network. In many instances, voltage support, backup, and other system reliability requirements must be provided locally. This can prevent lower cost power, located outside the immediate vicinity, to be utilized.

Market Structure Constraints: Another potential limiting constraint to attaining an optimal region-wide least cost dispatch is associated with market structure in many parts of the U.S. These market structure problems can be the result of poor market design and potential market manipulation, as seen in the Western U.S. during the 1999-2000 time period. Another equally important market structure issue is associated with the vertically integrated utility market structure that exists throughout most of the southeastern U.S.

A vertically integrated structure entails that generation, transmission, and distribution are all owned by one company. Many competitors find themselves in the position of having to compete with utilities that, in addition to owning generation, also control the monopoly transmission system used to move competitive wholesale electricity.

Many competitors argue that incumbent utilities' investments in generation can provide a powerful economic incentive to operate their monopoly transmission systems to favor their own utility-affiliated generation, and to discriminate against non-affiliated generators. In addition, an incumbent utility's significant investments in its own generation can also lead to distortions in the purchased power decisions that it makes on behalf of its captive customers. In this instance, incumbent utilities can have strong economic incentives to preference their own, or affiliate-owned, generation over competitors to maintain

their generation market share.

This inherent conflict of interest, a common characteristic of vertical market power, is the primary reason that regulators insist upon independent operation of the transmission grid. Many utilities would argue that since the passage of Order 888, and the implementation of Open Access Transmission Tariffs (OATTs), open and nondiscriminatory access has been the rule of the day for vertically integrated utilities. However, in its recent Standard Market Design (SMD) Notice of Proposed Rulemaking (NOPR), the FERC noted that, despite these competitive policies, vertically integrated utilities have still exercised their ability to manipulate power flows and discriminate against competitive providers. The FERC recently stated that:

Order No. 888 and Order No. 2000 set the foundation upon which to build regional transmission institutions and competitive electricity markets. However, as events have transpired, there remain significant impediments to competitive markets and to the infrastructure needed to meet our electric energy demand. *Unduly discriminatory transmission practices have continued to occur...*[FERC, Notice of Proposed Rulemaking, Docket Number RM01-12-000 at 15, emphasis added.]

Methods for Estimating Wholesale Market Efficiency Opportunities

One of the primary means of estimating efficiency opportunities for wholesale markets is by developing an economic dispatch model that simulates how power plants are actually run in a region. This baseline is then compared to a simulation based upon the most optimal solution. Here, "optimal," or the most "efficient," is defined as the least cost resource. Under an optimal dispatch, generators are essentially ranked, or "stacked" based upon their costs, with the lowest cost unit being utilized first, and the highest cost unit being utilized last.

Our method for developing an economic dispatch model for the region² was relatively straightforward. The steps followed include:

- (1) Developing a regional baseline wholesale electric supply curve to determine a baseline level of generation and production costs;
- (2) Estimating an optimal wholesale electric supply curve based upon least cost dispatch regardless of the type of provider; and
- (3) Taking the difference between the baseline and optimal supply curves to estimate the economic efficiency opportunities.

The data used in this analysis came from a variety of sources that included FERC Form 1s, Form EIA-411, RDI International Power Generation Database, Utility Data Institute, and the Environmental Protection Agency's EGRID air emissions database. The economic dispatch, or rank ordering, of facilities was based upon fuel costs as a measure of marginal costs. Thus, the savings estimated in the models are fuel-related only and do not include such items as capacity payments for securing the resources on a longer term basis.

Admittedly, this development of a wholesale power market is a simplification of the complex methods by which electricity markets work. In addition, this approach does not take into account the potentially considerable transmission or reliability constraints discussed earlier. This approach does, however, present a generalized estimate of forgone opportunities for expanded wholesale trade in the region. More sophisticated power market modeling approaches, which are virtually infinite in their assumptions and detail, could develop more detailed results. Nevertheless, the basic premise that more efficient generation can lead to lower wholesale prices, which in turn, can lead to lower prices for customers, remains unchanged even with a more sophisticated approach.

Empirical Estimates of Efficiency Opportunities From Expanded Wholesale Markets

The main efficiency opportunities examined in this study are the opportunities for new competitive power facilities to displace older incumbent utility generation. These older technologies usually consist of oil and gas

Table 1
Regional Oil and Gas-Fired Generating Capacity by Major Heat Rate Category

Heat Rate Category (Btu/kWh)	Active Capacity ³ (MW)	Operational Capacity (MW)
6,000 - 6,999	369	899
7,000 - 7,999	0	0
8,000 - 8,999	233	493
9,000 - 9,999	6,057	6,057
10,000 - 10,999	8,969	8,975
11,000 - 11,999	2,286	2,387
12,000 - 12,999	780	824
13,000 - 13,999	528	816
14,000 - 14,999	164	846
15,000 - 15,999	92	92
16,000 - 16,999	30	30
17,000 - 17,999	36	55
18,000 and above	16	16
Total	19,560	21,490

**Table 2
Top 25 High Heat Rate Units (Units 100 MW and Greater)**

Plant Name	COD	Fully Loaded Test Heat Rate	Actual Heat Rate	Capacity	Age	Annual Capacity Factor
Big Cajun 1, Unit 1	3/1/1972	10,322	10,700	115.0	31	11.0%
Lewis Creek 1	1/1/1962	10,352	10,810	271.4	41	60.2%
Lewis Creek 2	1/1/1962	10,352	10,590	271.4	41	59.9%
Robert E. Ritchie 1	6/1/1961	10,372	12,420	359.0	42	11.9%
Nelson 4	7/1/1970	10,419	11,660	591.8	33	35.8%
Willow Glen 1	3/1/1960	10,431	12,060	163.2	43	29.7%
Sabine 5	12/1/1979	10,442	11,160	507.4	24	51.9%
Nelson 3	3/1/1960	10,476	11,880	163.2	43	32.2%
Baxter Wilson 1	2/1/1967	10,480	10,220	544.6	36	38.2%
Rex Brown 4	9/1/1959	10,499	15,900	238.7	44	12.0%
Willow Glen 5	7/1/1976	10,622	12,820	591.8	27	18.4%
Big Cajun 1, Unit 2	4/1/1972	10,635	11,140	115.0	31	11.3%
Willow Glen 3	12/1/1968	10,698	11,130	591.8	35	16.5%
Willow Glen 2	1/1/1964	10,813	15,590	239.4	39	26.3%
McClellan 1	1/1/1972	10,868	--	136.0	31	32.9%
Michoud 2	2/1/1963	10,997	8,730	261.8	40	35.3%
Ninemile Point 2	7/1/1953	11,135	12,950	112.5	50	30.6%
Delta 1	11/1/1953	11,141	15,540	112.5	50	15.5%
Michoud 3	8/1/1967	11,288	11,020	582.3	36	47.5%
Harvey Couch 2	8/1/1954	11,372	14,480	156.3	49	9.7%
Michoud 1	5/1/1957	11,427	12,660	115.2	46	22.8%
Delta 2	12/1/1953	11,710	16,790	112.5	50	12.1%
Lake Catherine 4	4/1/1970	11,870	10,760	552.5	33	27.6%
Cecil Lynch 3	6/1/1954	12,012	20,400	156.3	49	3.2%
Lake Catherine 3	4/1/1953	12,208	13,660	119.5	50	12.1%

steam generation facilities. Table 1 breaks out the capacity associated with these older oil and gas fired steam units by major heat rate category in the Gulf South region. The table presents capacity figures for those oil and gas fired units that were generating power in 2000 (active), as well as those that were inactive but operational.

What is striking about this table is the fact that the older less efficient capacity currently in operation is not far in magnitude to the independent power generation capacity that is currently in operation, or under construction, in the region today. The older inefficient generation capacity ranges from 19,560 MW to 21,490 MW, while the announced merchant development for the region is around 28,138 MWs.

Table 2 shows, individually, the number of large (over 100 MW), high heat rate units that are currently in operation in the Gulf South region.⁴ This figures are based upon each unit's "full loaded test heat rate" which is an estimate of its best operating efficiency under full load conditions. In other words, it is the outer boundary of operational efficiency these units can meet. Their actual 2000 reported heat rates have been presented in an adjoining column of the table.

The first step in the analysis was to develop two separate regional supply curves. The first supply curve can be thought of as the baseline, and reflects an estimate of how power generation units in the region are currently being utilized. The base year for the analysis was 2000.

The second supply curve developed in the analysis is an approximation of the "optimal" least cost dispatch for the region. This curve treats all units equally, and runs the least cost power plant first, and the most expensive power plant last. Since a number of independent power facilities have, or will, come on line after 2000, similar curves have been developed for

the year 2003 and 2005. Electricity demand was also forecasted for this period based upon information provided by the North American Electric Reliability Council ("NERC").

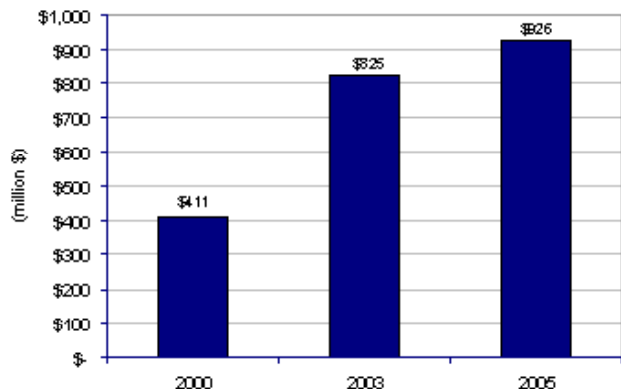
One of the main reasons for the efficiency improvements in the region comes from the displacement of older, less efficient utility generation facilities. Table 3 shows the trade-off between merchant and incumbent utility generation utilized in both the base case and the optimal case. In the estimated base case, incumbent generation is estimated to supply some 95 percent of the region's electricity. Competitive generation, on the other hand, accounts for only 5 percent of the region's estimated electricity supply. For the later years under the optimal dispatch scenario, the estimated competitive generation share of the region's generation increases moderately to approximately 27 percent while the estimated utility share falls to 73 percent.

Perhaps the most important estimate associated with this optimal dispatch analysis is the potential regional savings associated with regional efficiency improvements. Figure 2 presents these estimates savings for

the entire region for three separate years: 2000; 2003; and 2005. The savings become greater as we move out to later years since more low-cost/high efficient generation comes on line.

Perhaps the most important issue associated with these savings is what they could possibly mean to rate-payers. We estimated that if all of these efficiency gains could be achieved for customers, there would be a sizable one-time benefit for the region, in general, and Louisiana,

Figure 2
Estimated Total Regional Savings Associated with Efficiency Gains (\$ Millions)



more specifically.

Table 4 shows the total regional savings associated with more efficient generation in 2000, 2003, and 2005. Three different sets of saving estimates are presented in the table. The first column identifies total estimated regional savings for the entire Entergy sub-region area of the southeast. The second column presents the estimated savings for the Entergy operating companies within the overall Entergy sub-region. The third column provides an estimate of the savings that would accrue to Louisiana operating companies and their customers.

Allocating total Louisiana savings based upon the total sales share for each class can develop a rough approximation of the benefits per customer class in Louisiana. Table 5 breaks these savings out on per customer basis for each major customer class.

It is important to keep in mind that the estimates presented in Tables 3 through 6 are based upon a generalized economic dispatch model that does not take into account transmission or reliability constraints. In addition, these estimates do not include capacity payments to generators, which would be required to secure this capacity over longer periods of time. Both factors would tend to dampen the total savings estimates. As a result, these estimates should be thought of as the outer limit, or “book ends” of savings possible from increased wholesale competition, and the displacement of older utility generation.

Conclusions

Over the past year the merchant power a souring economy, industry scandals, regulatory uncertainty, and declining access to capital markets for continued development have rocked industry. As a result, a number of the projects that were originally envisioned for development in the southeast, and around the U.S., have been cancelled. Despite the industry setback, there is still a considerable amount of new development likely to come on-line in Gulf South region over the next several years.

The ongoing challenge for competitive independent power facilities throughout the region will be their access to markets. While difficult for many regulators to understand, independent power facilities locate close to the loads they would like to serve. There have been some claims that IPPs are locating in the natural gas-rich Gulf South to serve loads in areas as remote as the northeast and California. The argument by many of these critics has been that these developers are in the region to pilage its natural resources, and its generous tax breaks, and export the power to far and sundry places with little to no local economic benefits.⁵

However, IPPs have located in region to serve regional loads. Existing incumbent utility generation in this region rests heavily upon a large number of old, inefficient oil and gas fired power generation facilities that should be retired. These older units create an economic and profit opportunity for independent power developers; that is, to earn a profit by serving these loads and displacing older, less efficient utility generation. However, to date, the ability to capitalize on this inefficiency has been il-

Table 3
Shifts in Generation Shares

Year	Base Case		Simulation Case	
	Percent Utility Generation	Percent Merchant Generation	Percent Utility Generation	Percent Merchant Generation
2000	94.55%	5.45%	95.42%	4.58%
2003	94.65%	5.35%	72.46%	27.54%
2005	94.79%	5.21%	73.17%	26.83%

lusive. Independent power plants still struggle to find a home for their power despite the fact that units which are decades old, and orders of magnitude less efficient, are still running.

There are a number of legitimate reasons why these competitive facilities may not be getting a greater piece of the region’s generation pie. As noted earlier, there may be significant transmission and reliability constraints that prevent these facilities from being used. As some incumbent utilities have noted, some of these facilities may

simply be in the wrong place given existing infrastructure constraints. In addition, one of the largest potential purchasers of wholesale energy, Entergy and its regional operating companies, has been soliciting bids from competitive providers over the past several years. The Louisiana Public Service Commission recently instituted a competitive bidding requirement on utilities that requires them to issue their resource requirements out to competitive bid. Given

this framework, one would think that if the capacity and energy bids from these merchant providers were competitive, awards would have been offered and accepted.

Many in the independent power community, on the other hand, recognize that all of these benefits may be difficult to attain in the short run due to legitimate infrastructure constraints. If there were an independent authority governing the transmission system, and making decision about the economic utilization of the region's power grid, constraints associated with transmission and reliability may be easier for many competitors to accept. However, many competitive merchants believe that market structure problems associated with vertically integrated incumbent utilities controlling the grid is the source of the problem, and

these estimates should be thought of as the "book-ends" of the economic opportunities for the region. We hope

Table 4
Break out of Estimated Regional Savings from Efficiency Gains

Year	Estimated Regional Savings	Estimated Entergy Savings	Estimated Louisiana Savings
2000	\$ 410,502,359	\$ 360,630,040	\$ 177,634,433
2003	\$ 824,994,006	\$ 724,764,706	\$ 356,995,129
2005	\$ 926,245,723	\$ 813,715,256	\$ 400,809,229

that this analysis will open further discussion about why so many older, uneconomic units continue to run in this region, when more efficient, environmentally sensitive resources located in region could be utilized.

Footnotes

¹The authors are Associate Professor and Research Associate, respectively, at the Center for Energy Studies, Louisiana State University. This article is an abbreviated version of a longer study recently completed by the authors. The study can be downloaded from the LSU-CES homepage at: www.enrg.lsu.edu/publications.

²Throughout the remainder of this article, "region" is specifically defined as the Entergy sub-region of the Southeastern Electric Reliability Council (SERC), or more generally as the "Gulf South" region.

³Active capacity is defined as those plants that had positive generation in the base year, 2000.

⁴A number of utilities operate

in the Entergy sub-region other than the operating companies of Entergy Corp. Thus, the units presented in Table 2 include those of other utilities operating in the Entergy subregion.

⁵In the longer version of this study, we found that merchant power generators were responsible for over \$4 billion in capital investment in the Louisiana economy regardless of whether any power was sold in the state or not. In addition, the economic impacts of constructing these facilities amounts to some \$1.5 billion, while the annual impact of operation of the facilities results in an economic impact of close to \$1 billion.

Table 5
Break out of Estimated Louisiana Per Customer Savings by Customer Class

Year	Estimated Savings Per Customer Residential	Estimated Savings Per Customer Commercial	Estimated Savings Per Customer Industrial
2000	\$ 48.12	\$ 299.86	\$ 7,386.36
2003	\$ 96.71	\$ 602.64	\$ 14,844.50
2005	\$ 108.58	\$ 676.60	\$ 16,666.37

resulting in a significant number of economic opportunities being unattained. Many have also complained about the competitive bidding practices of the region's incumbent utilities and the fairness of these processes.

This paper (and the longer report upon which it is based) has provided a number of estimates of the potential savings that could accrue from a more vibrant regional power market in which newer sources of power could be utilized in a fashion comparable to existing utility generation. We recognized that this approach is based upon empirical modeling, which by its definition is an approximation of the real thing. As noted elsewhere in this report,

Natural Gas Regulatory & Restructuring Assistance in Romania: An Appraisal of the Support For Energy Sector Reform in Eastern Europe

By Robert E. Borgström*

Introduction

With the historic reformation of economies throughout Central and Eastern Europe and in the former Soviet Union, government-funded projects providing advisory services and technical assistance have helped transitional economies in their efforts to create competitive, free markets within the context of independent regulation. This paper describes one such project, a US-funded program of regulatory and restructuring assistance in support of the Romanian gas sector, highlighting its objectives and accomplishments, suggesting areas for further activities and concluding with guarded optimism for the future.

Background

Since the collapse of the Ceausescu regime at the end of 1989, the Romanian government has taken several steps to reform its energy sector in order to attract private investment and an inflow of foreign capital, which is needed for infrastructural refurbishment and system development. These steps included the establishment of “independent” regulatory authorities, the opening-up of markets for certain large volume purchasers, the adjustment of prices for “captive customers” such that they more closely reflected the true costs of service being provided and the restructuring of state-owned enterprises to create more focused business units in anticipation of privatization. Despite these steps – or perhaps because of the caution with which they were taken – Romania lags behind its neighbors in creating a free market for energy. This deficiency, amongst others, imperils Romania’s accession to the European Union (EU), without which, and the market opportunities that it will bring, Romania’s economic recovery is ultimately at risk.

In 2000, the United States Agency for International Development (USAID) – through its contractor, Nexant, Inc. (a Bechtel-Affiliated Company) – funded a two-year project to assist the Romanian effort to create a competitive, free market for natural gas in Romania and lay the foundation for its participation in the European gas market. This project built upon other, earlier US-funded efforts aimed at the transformation of the Romanian power sec-

tor as well as other, complementary programs of support from the European Community.

Counterparts included the Romanian Ministry of Industry and Resources (renamed in 2003 as the Ministry of Economy and Trade), the Romanian Natural Gas Regulatory Authority (“ANRGN”), and the vertically dis-integrated elements of the former, state-owned gas monopoly, Romgaz. These new, but still state-owned business units are Romgaz (the “old” name applied to a new company for exploration, development and storage); Transgaz (transportation); and Distrigaz-Nord and Distrigaz-Sud (distribution). The project addressed only the needs of the state enterprises in transition. Excluded were Romania’s already private exploration and distribution companies, which represent roughly 20% of Romania’s total domestic market for natural gas.

Objectives

Work focused on three subject areas:

- The adoption of a Commercial Code.
- The adoption of a Technical Code.
- The adoption of a Public Participation Strategy for ANRGN.

The Commercial Code outlines the rules for transactions amongst market participants, and the Technical Code ensures that there will be high standards of quality, safety and environmental protection for those participants. These “Codes” are essential “Market Rules” that form a framework of fairness and transparency for the operation of a free market.

The concept of a Public Participation Strategy at ANRGN was intended to involve stakeholders in the regulatory process by replacing the behind-closed-doors procedures of a command economy with the paradigm of transparency that fosters investor and consumer confidence in the marketplace. This strategy was also seen as an opportunity to provide a model of greater customer-focus for other elements of the sector to emulate, as well as a mechanism by which the public could become better informed about issues affecting utility operations and economics.

Project Activities

It was specifically intended that the advisory services provided by the project should become a catalyst for dialogues from which realistic reforms could be fashioned by the industry professionals who would ultimately be responsible for their implementation.

A Romanian “Project Team”, composed of utility and regulatory managers from ANRGN and the industry’s business units, was selected to take responsibility for researching various issues, making presentations on the results of that research and preparing final documents leading toward the actual adoption of the Codes and the Strategy (outlined above). It was expected that, at the conclusion of the project, this core group’s continuing

* Since 1992, Mr. Borgström, as a project manager for Nexant, Inc. (and its predecessor, Bechtel Consulting) and as a senior manager with Price Waterhouse in its International Privatization Group, has led energy sector restructuring projects in the transitional economies of Central and Eastern Europe and in the former Soviet Union. Mr. Borgström’s comments do not necessarily reflect an official position of USAID and/or any USAID-funded contractor(s)/organization(s).

leadership would sustain the promotion of the reform agenda amongst colleagues at their respective organizations. It is significant to note that the members of the Project Team were specifically drawn from “middle management” – i.e. the career staff members who would become the next generation of senior management – rather than from the “senior” levels of management, which are political appointees.

In addition to maintaining a full-time project office within ANRGN’s headquarters in Bucharest so that resident consultants could work with counterparts on a day-to-day basis, the Project brought several consultants from the USA and UK to Romania on short-term assignments to provide information, examples and lessons learned from the reform and restructuring efforts in other countries around the world. Each short-term assignment concluded with an informal “in-house” seminar on the immediate issues.

A series of more formal, “Key Issues” seminars was conducted at venues around Romania to explore pertinent themes supporting the reform agenda. Each of these seminars featured guest speakers from internationally recognized organizations. (Accenture, the Emerging Markets Partnership, the Federal Energy Regulatory Commission and Merrill Lynch generously donated the time of senior-level employees to support the project.) In addition to plenary sessions with prepared presentations, round-table discussions provided open forums by which the Romanian colleagues could explore issues of specific concern.

A focal point of the Project was a Study Tour to Washington, DC during which the Project Team met with counterparts at Federal and State regulatory agencies (FERC, the District of Columbia and Maryland), local gas distribution companies (Baltimore Gas & Electric; Washington Gas) and various trade associations (AGA, INGAA, Natural Gas Supply Assn.). This Tour complemented the in-country work and provided the Romanian team members, some of who had not previously traveled in “Western” countries, an important opportunity to observe how their counterparts in the USA addressed issues of common concern. The expectation was not that a particular American model or approach could necessarily be duplicated under Romanian conditions. It was, however, the intention to present the group with the opportunity of learning about another model so that they could apply certain elements thereof to the specifics of Romania’s evolving economic and regulatory situation.

Accomplishments

1) Market Rules

In the collaborative way described above, the two essential Market Rules were developed and published in Romania’s “Official Gazette” during 2002. The publication of these “Codes” was an extremely important milestone in that it was Romania’s first comprehensive framework

for the functioning of its gas sector in response to market signals rather than decisions of the State.

Under these Codes, the State, through its regulatory authority has the critical role of establishing fair methodologies for tariffs and approving the request of companies to charge tariffs that are proposed within those methodologies. In principle, the State is thus prohibited from intervention in the decisions of the marketplace so long as those decisions are consistent with the Market Rules by which all participants must abide.

Pro-active implementation of this Code will be a crucial test of the Romanian government’s commitment to meaningful reform. This year (2003), however, it is planned that only 54 large volume customers in Romania will have the opportunity to purchase natural gas on the “open market.” This accounts for approximately 30% of Romania’s total natural gas market. For the rest of Romanian households and businesses, the State authority continues to set prices, a decision-making process into which the vast majority of Romanian consumers still have very little, if any, relevant input.

2) Public Participation Strategy

Another important milestone was reached at the end of 2001 with ANRGN’s development of a Public Participation Strategy. This strategy, when implemented through public meetings and other outreach programs, can strengthen the regulatory process through public dialogue and the involvement of stakeholders. ANRGN is still a long way from the US model of public hearings, but by having developed its Public Participation Strategy, the Romanian regulator has taken an important step in encouraging transparency throughout the sector.

The regulator’s Public Participation Strategy is also an important platform to inform stakeholders about energy issues and, amongst other important topics, it should be used to promote a broader understanding of utility economics. The opening up of a free market and the interim stages of setting cost-reflective tariffs are flash point issues in a country where the historically-encultured view is that the government, as an expression of its social leadership, guaranteed the population a broad range of goods and services, including natural gas at low prices.

Within the closed economic system that Romania had before 1989, natural gas could be sold to citizens and state enterprises at prices that met political objectives because the vertically integrated supply chain was wholly owned by the state and the real costs of providing gas service could be absorbed by the State budget, either through cross-subsidies or outright fiscal obfuscation. With the reform of Romania’s economic system – particularly now that the government needs to encourage private investment in the sector – it is unrealistic to expect that utilities will be able to provide energy at prices that neither fully recover costs nor provide a reasonable return to the investor. This reality needs to be explained to customers, many of who still believe that heavily subsidized energy

service is their right.

There are, of course, people in Romania, as in every society around the world, who are legitimately unable to afford needed services such as natural gas for cooking and heating their homes. Arguably, governments have a humanitarian obligation to develop programs that address these elemental social needs. Such programs must, however, be sharply focused so as not to become open-ended systems of patronage for the electorate. The regulatory authority can provide an important service by using its public participation forum as a venue for forthright discussions and explications of these and other contentious transitional issues.

To assist in framing this opportunity, the project conducted a “Practice” Public Meeting at which a panel from ANRGN was asked to prepare a presentation on tariff methodologies for a “public” audience. A “practice” audience was selected to ask questions of the panel. The “planted” questions, which were often frustrating to the panel, clearly demonstrated to the participants the futility of trying to “control” public discourse in an open forum, and the need for the “authority” to be more flexible and consumer-oriented in articulating evolutionary policies and principles.

Conclusion – A Guarded Optimism

There are many reasons to be optimistic about the Romanian gas sector over the long-term. It is staffed with professionals of considerable experience in the safe and reliable running of a gas system. Coupled with Romania’s natural resource base, the uniqueness in the region of its gas storage capabilities and its historic position as a transit corridor across Southeastern Europe – a route that will be increasingly important over the coming years – Romania’s gas sector can support economic growth in Romania by providing a high standard of service within the country and by becoming an important player in the European gas market. The project was founded upon this optimism.

Recognizing Romania’s goal of EU accession, the project supported a meaningfully independent reorganization of the Romanian gas sector such that the components of that sector could compete successfully in the broader and more mature European market. By focusing attention upon the development of future managers, it was specifically intended that the sector’s employees should become successful competitors for employment when plans for business unit privatizations came to fruition and foreign investors would require new business skills of its management teams. Encouraging comments from Project Team members indicate that the project’s approach was successful in providing them with access to new ideas and business approaches that can be applied in the years to come.

Unfortunately, however, it must be said that the political leadership in Romania continues to move very cautiously in divesting its control over the sector’s ownership and man-

agement. Plans for privatization of the two state-owned gas distribution companies are well behind schedule, as are similar plans in other, related energy sectors. Even more critically, the ostensibly “independent” regulatory authority – now well into its third year of activities – is still closely “coordinated” by the Ministry.

Political leaders will argue that the critical importance of the sector is a just rationale for cautious approaches to change, but those arguments are disingenuous. Romania is not the first country to implement market-based reforms. Other Central and Eastern European countries have accumulated over a decade of relevant experience on the problems that Romania is facing. Assistance programs have been instrumental in sharing the lessons learned from that wealth of experience. It remains for Romania’s leadership to recognize that actions taken in the fullness of bureaucratic time are not necessarily taken in Romania’s competitive best interest.

President’s Message *(continued from page 3)*

of the first Gulf War, James Schlesinger wrote that “the US ability to determine events in the Middle East with all that region’s complexities and historical antagonisms is far less than we assume it to be. We should be modest in establishing our objectives and quite satisfied with a set of political arrangements which are not hostile to the American interests, even if they fall short of our many ideals in other respects.”

Also in my March letter, I commented that international colloquy and bridge-building was sorely needed and that I was looking forward to the IAEE International Conference in Prague in June and the USAEE North American Conference in Mexico City (October 19-21). I’m happy to report that the Prague meeting was an enormous success. I am extremely pleased that more than 125 papers have been submitted for the Mexico City conference being organized by the Mexican and Canadian affiliates of the IAEE in addition to the USAEE. Program Chairman Pablo Mulás has done a superb job of organizing the conference, assisted by José M. Gonzalez, André Plourde, and a large and hard-working delegation from the USAEE. Attendees will have the opportunity to join with industry leaders and prominent researchers to discuss the important issues in the integration of the North American energy markets.

Education and communication are critical. Energy issues remain front and center on the public policy agenda. As I said before, the USAEE remains strong and vibrant, and your council will endeavor to keep it that way. Please contact me or our Executive Director Dave Williams if you have questions or requests.

Adam Sieminski

Endnotes

¹ Since, Energy Information Administration (EIA) energy data are household data, and the projections available are for population, using the number of household members, EIA household energy data were converted into energy per capita.

² Energy-efficiency gains from the purchase of new energy-efficient appliances are not considered.

³ EIA forecasts household energy demand to grow 27 percent between 2000 and 2025—driven by increase in electricity demand. EIA's forecast is for 25.4 quads of primary energy—including losses in electricity generation and transmission.

⁴ Those born between 1946 and 1964 are considered to be “baby boomers.” (Campbell 1996)

⁵ The population group of a RECS household is determined by the population group of the “Head of the House” or the householder.

⁶ There are several measures for household energy intensity—depending on the demand indicator used such as household, building, square foot, etc. Quite often energy intensity is incorrectly used as a measurement of energy efficiency. Several effects such as structural, weather, and energy efficiency are embodied in energy intensity. For a complete discussion of the definitions and measurement of energy intensity and energy efficiency please see EIA's “Energy Efficiency Page” at <http://www.eia.doe.gov/emeu/efficiency>.

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Endnotes

¹ There is yet little research on the effectiveness of global codes (like the UN Global Compact). Sethi argues that neither proponents nor code critics want to do the research, allowing both sides to claim victory (2000:p.119). Others active in the field suggest that global codes of conduct are nonetheless “an idea whose time has come” (Williams 2000).

² Martens and Crowell (2003) cite additional barriers to whistle blowing: divided loyalties among family, authority, and organization; political history (“informing” may carry negative connotations); logistics (time zones and languages); and fear of retribution despite legal protections. They suggest involving international managers, clarifying wrongdoing, easing reporting processes, and crafting culturally sensitive messages.

³ Research findings are derived from Bhagat, et al (2002), Davis et al (1997), Huff & Kelley (2003), Randolf & Sashkin (2002), as well as Hofstede (2001). Hofstede's definitions of cultural characteristics were used.

Boyle (continued from page 20)

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USAEE BEST STUDENT PAPER AWARD GUIDELINES

USAEE is pleased to once again offer an award for the Best Student Paper on energy economics. The award will consist of a \$1000.00 cash prize plus waiver of conference registration fees at the 23rd IAEE North American Conference, October 19-21, 2003. To be considered for the USAEE Best Student Paper Award please follow the below guidelines.

- Student must be a member of USAEE or IAEE in good standing.
- Electronically Submit COMPLETE paper by **July 25, 2003** to USAEE Headquarters.
- Paper MUST be original work by the student (at least 50% of work completed by the student seeking award).
- Submit a letter stating that you are a full-time student and are not employed full-time. The letter should briefly describe your energy interests and tell what you hope to accomplish by attending the conference. The letter should also provide the name and contact information of your main faculty supervisor or your department chair. Also, include a copy of your student identification card.
- Submit a brief letter from a faculty member, preferably your main faculty supervisor, indicating your research interests, the nature of your academic program, and your academic progress. The faculty member should state whether he or she recommends that you be awarded the scholarship funds.

Complete applications should be submitted to the USAEE Headquarters office no later than July 25, 2003 for consideration. Please submit all above materials electronically to usaee@usaee.org

NOTE: The recipient of the \$1000.00 cash prize will receive notification of this award and be presented the award at the Mexico City IAEE North American Conference. This individual will also receive a complimentary registration to attend the meeting. Please note that all travel (ground/air, etc.) and hotel accommodations, meal costs in addition to conference-provided meals, etc., will be the responsibility of the award recipient.

For further questions regarding USAEE's Best Paper Award, please do not hesitate to contact David Williams at 216-464-2785 or via e-mail at: usaee@usaee.org

23rd IAEE NORTH AMERICAN CONFERENCE STUDENT SCHOLARSHIPS AVAILABLE

USAEE is offering a limited number of student scholarships to the 23RD IAEE North American Conference. Any student applying to receive scholarship funds should:

- 1) Submit a letter stating that you are a full-time student and are not employed full-time. The letter should briefly describe your energy interests and tell what you hope to accomplish by attending the conference. The letter should also provide the name and contact information for your main faculty supervisor or your department chair, and should include a copy of your student identification card.
- 2) Submit a brief letter from a faculty member, preferably your main faculty supervisor, indicating your research interests, the nature of your academic program, and your academic progress. The faculty member should state whether he or she recommends that you be awarded the scholarship funds.

USAEE scholarship funds will be used only to cover conference registration fees for the 23RD IAEE North American Conference. All travel (air/ground, etc.) and hotel accommodations, meal costs in addition to conference-provided meals, etc. will be the responsibility of each individual recipient of scholarship funds.

Completed applications should be submitted electronically to USAEE Headquarters office no later than October 7, 2003. Email to usaee@usaee.org

Students who do not wish to apply for scholarship funds may also attend the conference at the reduced student registration fee. Please respond to item #1 above to qualify for this special reduced registration rate. Please note that USAEE reserves the right to verify student status in accepting reduced registration fees.

If you have any further questions regarding USAEE's scholarship program, please do not hesitate to contact David Williams, USAEE Executive Director at 216-464-2785 or via e-mail at: usaee@usaee.org

What Do Natural Gas Numbers Show?

. . . Surprise!

By Joseph M. Dukert

It has long been U.S. national policy to place a special focus on natural gas, because it is relatively clean-burning and we have been able to get just about all we need from North America. So everybody accepts the fact that we have been using more and more natural gas for some time now . . . **right?**

That's why high prices and low storage levels prompted Fed Chairman Alan Greenspan to warn Congress in June¹ that (with Canada unable to continue complementing our falling domestic production adequately) parts of our national economy could be headed toward dire straits as we approach a supply-demand crunch . . . **right?**

And that's why the responsible mass media picked up on Greenspan's mention of LNG as our savior, and selectively quoted energy experts (sometimes even the same expert) who told us that by 2020 liquefied natural gas imports could make up 5 percent – or 10 to 20 percent – of U.S. gas supplies.² **Right?**

Sorry, but have you looked at the statistics (which seem to belie some popular beliefs)? I may not be drawing all the right conclusions from them; but perhaps this article will get useful reactions from other members of USAEE.³

Concern about our future gas supply is justified. LNG is likely to play an increasing and important role for this country (although not exactly the one that has been ballyhooed). Canada (and others in North America) do face tough decisions in regard to natural gas policy in the near future. But I don't believe the energy sky is falling. And I consider it slightly irresponsible to assume that LNG is ready to save us as a *deus ex machina*.⁴

The most egregious error I keep seeing in most public discussions about natural gas is the automatic assumption that total U.S. demand has been climbing steadily. Whoever prepared Chairman Greenspan's testimony was more careful than most, and it is worth reading in its entirety. But he still said that "natural gas has gradually increased its share of total energy use" since 1985. That's a real stretch. Table 1.3 of the Energy Information Administration's *Monthly Energy Review* for May 2003 had just reported that the share of gas in U.S. energy consumption rose by a total of less than one percent between 1985 and 2002 – a "gradual" increase, indeed, over 17 years!

In fact, despite an obvious shift toward gas in the electricity generation sector, the total U.S. consumption of gas has been essentially flat since 1996 – 23.197 quads then vs. 23.838 last year.⁵ Domestic production has followed a similar path since 1994 – 19.348 then vs. 19.559 in 2002.⁶ That *MER* (the latest available at the time I wrote this article) contained consumption data for only January and February of this year; but those two months failed to show any alarming surge; their combined total was almost identical to the numbers for the first two months of

2001 – despite our snowy winter. (Table 1.10 in the same *MER* showed that heating-degree days between July 1, 2002 and April 30, 2003 showed a 13 percent rise from the previous year, although they were quite close to the U.S. norm for the past three decades.)

How does one explain flat demand, in light of the fact that natural gas is probably being used in a higher percentage of homes and other buildings in this country than ever before?⁷ I suggest that the most logical explanation lies in improved efficiency for heating units – accompanied, perhaps, by continuing improvements in building insulation and in temperature-control systems and practices. That would imply that the consumption of gas per residential and commercial user has dropped appreciably. Of course we shouldn't assume complacently that this efficiency trend will continue indefinitely (even though it represents another aspect of our avowed national energy policy).

Dry gas production in this country has also been flat – since at least 1994. U.S. output in 2002 was actually slightly higher than it had been back then; and production figures for the first two months of this year were above last year's.⁸

How much gas do we keep "on the shelf" to handle unpredictable demand surges? A major point made by *The New York Times* on June 17 was that "Stored supplies of natural gas have fallen to the lowest level since the federal government began keep statistics in 1976, with levels about 30 percent below the average for the last five years."⁹ Barely a week later, the same newspaper softened that warning slightly by saying U.S. storage was "near record lows"; but added that levels "have also fallen sharply in Canada".¹⁰

What was omitted is that the U.S. week-by-week storage curve had closely followed the five-year minimum and by late June was trending up sharply toward the average. There may well be cause for concern in some regions (this is worth checking); but Figure 4.1 of the same *Monthly Energy Review* cited earlier indicates that total, end-of-year underground storage of gas hasn't varied a great deal since 1990. The *MER* graph appears to show that at the end of February, 2003 gas in storage was well below any point reached in 2002, but no lower than at the same time the year before. And a look at Table 4.1 suggests why: Additions to storage during 2001 (when demand dropped sharply, from the all-time peak of 24.057 quads to a six-year low of 22.941¹¹) were by far the highest ever recorded – a whopping 3.5 tcf.¹² That means that in 2001 we were swelling our stores by nearly eight weeks of supply, even based on what proved to be a temporary peak for demand in 2000.

The economic downturn in 2001, especially after the terrorist attack of 9/11 and the air of uncertainty that followed, probably helps to explain why gas consumption has not risen. Use of natural gas for electricity generation is clearly the most important component of demand growth; but cancellations and cutbacks in the orders for and use of combined cycle gas turbines in this country have been widely (and accurately) reported. Fuel switching

based on the price elasticity of demand in the industrial sector is probably another dampening factor. There is no denying that gas prices have climbed much more rapidly than those for the types of oil that can often be used as substitutes.

Our international president, Michelle Foss, talked much good sense about natural gas pricing in her own prepared testimony a short time after Greenspan's; but it wasn't clear that any of the subcommittee members on that day had bothered to read what she had written, and she got only about five minutes to summarize it. (Yes, I know that this is what committee staffs are for; but I found little evidence that they had prepared members with thoughtful questions.) At any rate, you might read for yourself what Michelle wrote, which treats the oil-gas relationship, important variables that apply to the resource base, and an objective balance between risks and opportunities. It's available at www.house.gov/resources/108cong/energy/2003jun19/agenda.htm.

Are pipeline imports dwindling? Last year was a record year for U.S. gas imports from Canada, representing 16.3 percent of our 2002 consumption (an impressive and welcome share, but not quite the 20 percent number bandied about by some instant pundits). And EIA's *International Energy Outlook* gave its opinion in May that "Canada's natural gas resources appear adequate through 2025."¹³ However, *IEO-2003* did note that exploration and development costs for conventional gas might rise because of field depletion in the West and recent disappointing results in Maritimes offshore gas drilling.

The chairman of the Canadian Energy Pipeline Association recently projected that Canada would not be able to maintain its production beyond 2009 without tapping unconventional gas and (more importantly) "Northern gas" along the Mackenzie Delta pipeline.¹⁴ Both potential increments seem like pretty safe bets, however – in which case his projection anticipates an increase in national production of roughly 40 percent within a decade. When Alberta Premier Ralph Klein and his Energy Minister visited New York and Washington in late June they both expressed high hopes for increasing supplies from the Eastern Slope and from coalbed methane, as well as through the new pipeline expansion.¹⁵

Some commentators note parenthetically that the United States itself is now a net exporter of natural gas to Mexico. That's true; but this short-term "leakage" should be a cause for optimism rather than pessimism about our national supply balance. The volumes of U.S. gas sales to Mexico have been growing (to slightly more than half a trillion cubic feet last year¹⁶), but they are still modest in comparison with total domestic production and imports from Canada. Much of this serves to fuel new gas-fired generating plants in Mexico, and some of these units are dedicated from the outset to sending substantial fractions of their power output back into the United States (reducing demand for gas in this country). LNG facilities being authorized on both coasts by Mexico's *Comisión Reguladora de Energía* (CRE) can feed into the truly

North American grid that is developing rapidly.

The healthy, mutually beneficial, two-way trade in various types of energy across our southern border could also spur much-needed fiscal and structural reforms in Mexico (even after the setback to President Fox's party in the July elections). It is clear that Pemex will not be privatized (nor is this necessary), but a revitalized parastatal hydrocarbon company – with acceptable assistance from the private sector – could develop major new sources of gas for North America in the Burgos Basin and the Gulf of Mexico close to the international border.

So, what's the situation overall? EIA's *Short-Term Energy Outlook* for July¹⁷ reported that more than 900 active U.S. drilling rigs were looking for gas during June and the number was "likely to exceed 1000 in the next month or two". Working gas storage injections had just set a monthly record in June of 487 bcf (about 40 percent above normal). Spot prices had dropped during June by 15-20 percent (i.e., by 90 cents to \$1.25 per mmBtu). On July 9 the gas price on the futures market for February '04 was down almost a dollar from its high.¹⁸

Gas in the range of \$4.35 (which is approximately what EIA has recently projected as next year's average, assuming "normal" weather) is still expensive by historic standards. Alan Greenspan was certainly right on that call. And the price graph for the past couple of years looks like a roller coaster – a situation that discourages investment all around. But that's why I believe he was pushing LNG – although his "explanation" was typically Delphic. Liquefied natural gas need not account for a large share of the total market to serve as a ceiling on prices from domestic production and pipeline imports. With expanded receiving facilities, the ever-present possibility of arbitrage should be enough to stabilize prices even if LNG never actually satisfies more than five percent of our national demand (which seems to me a reasonable target a decade hence).

A quarter century or so ago, the federal government (and many energy specialists – including me, I must confess) thought that the natural gas supplies available to us were so limited that the fuel should be directed exclusively to its "best and highest use" – stoves and space heating systems. Lifting price controls demonstrated that this was foolish policy. What concerns me now is that apprehension produced again by short-sighted perceptions of "crisis" could keep us from fully utilizing natural gas, through "demand destruction".

Let's figure out a way to produce and deliver more gas from the Rockies. Let's get on with the Alaska highway pipeline (in addition to the roughly parallel route exclusively inside Canada – since about one-third of its capacity may well wind up being used in connection with extracting liquid fuels from Alberta's oil sands). Let's facilitate distributed generation based on gas, without dreading that the fuel can't be made available at an affordable price. Let's put the Enron debacle behind us and recognize that electronic markets need to become more liquid again.¹⁹ Above all, let's keep pushing energy efficiency – which often makes

the most economic sense of all.

Let's just not panic. And, for gosh sakes, let's keep looking at the real numbers!

Endnotes

¹ Testimony of Chairman Alan Greenspan, "Natural gas supply and demand issues" before the Committee on Energy and Commerce, U.S. House of Representatives, June 10, 2003 (available at the Fed's website – <http://www.federalreserve.gov/boarddocs/testimony/2003>)

² On June 27, 2003, Peter Behr of *The Washington Post* (p. E3) quoted Daniel Yergin as saying that by 2020 LNG imports could be supplying 10 to 20 percent of U.S. gas supplies. On the very same day, *The New York Times'* Matthew Wald quoted Yergin on page C2 as pegging the 2020 number at 5 percent. A few weeks earlier, a report from Yergin's firm projected that LNG imports could reach as much as 11 percent of our annual requirements as soon as 2010 – a forecast that I personally think is off the wall. Should we wonder that legislators and the public are confused?

³ My address is dukert@erols.com, and I'm not thin-skinned about criticism.

⁴ On July 9, 2003, former National Security Advisor Robert McFarlane wrote in *The Wall Street Journal* (p. A14) that Russian gas from its Yamal peninsula alone could satisfy U.S. LNG requirements for 400 years.

⁵ EIA, *Monthly Energy Review*, May 2003, Table 1.3.

⁶ *Ibid.*, Table 1.2.

⁷ The last official *Residential Energy Consumption Survey* produced data that is now six years old, but this seems like a fair assumption because of greater availability in regions such as New England. In 1997, 61 percent of all U.S. residences used natural gas in some way.

⁸ *MER*, May 2003, Table 4.1.

⁹ Simon Romero, "Short Supply of Natural Gas Is Raising Economic Worries", *The New York Times*, June 17, 2003, p. A1.

¹⁰ Bernard Simon, "Canada Is Losing Ability to Fill U.S. Gas Needs", *The New York Times*, June 26, 2003, p. C1.

¹¹ *Ibid.*, Table 1.3.

¹² *Ibid.*, Table 4.1.

¹³ Energy Information Administration, *International Energy Outlook 2003*, p. 53.

¹⁴ Presentation by Ron Turner, Executive Vice President of TransCanada PipeLines, Ltd., during a conference on "Growing Our Energy Trade" at the Canadian Embassy in Washington, June 12, 2003.

¹⁵ Luncheon talk in Washington DC, June 25, 2003, sponsored by the U.S. Energy Association and Edison Electric Institute.

¹⁶ *MER*, May 2003, Table 4.3)

¹⁷ Accessed from the website: <http://www.eia.doe.gov>

¹⁸ *The Wall Street Journal*, July 10, 2003, p. C12.

¹⁹ At the Natural Gas "Summit" of the National Petroleum Council summoned by Energy Secretary Abraham on

June 26, Elizabeth Spomer of British Gas, LNG Services, said the lack of liquidity in the market due to the demise of the marketers could be adding \$1 to the cost of gas. (e-mail summary from Shirley Neff, of Goldwyn International Strategies).

News (continued from page 5)

Secure Transactions:

IAEE has taken the time to bring its site forms up to date, including the secure transfer of personal information submitted online. IAEE now uses 128 bit encryption on all its forms.

Members Only Content:

A new login system has been implemented to allow members access to restricted information, such as the online Membership Directory. To login, click the "log in" link at the top of the site. If you have questions about this feature, or if you need to update your contact information with us, contact the IAEE Office.

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Integrating the Energy Markets in North America: Issues & Problems, Terms & Conditions

23rd IAEE North American Conference

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October 19 – 21, 2003

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North American Energy Security and Reliability

Session Co-Chairs: Juan Eibenschutz, CNSNS-Mexico and Barry Worthington, U.S. Energy Association

- Interdependence
- Opportunities
- Vulnerabilities

Energy Trade and Transportation: Forward or Reverse?

Session Co-Chairs: Joseph M. Dukert, Energy Consultant and Shirley J. Neff, Goldwyn International Strategies

- Competitive economics or dated policies
- Transparency and regulatory harmonization
- Corporate interests versus political realities

Gas and Power—Convergence or Divergence?

Session Co-Chairs: Michelle Michot Foss, University of Houston and Javier Estrada, Consultant

- Midstream issues: affiliate, market power
- LNG: myth or reality?
- What if low gas prices really were the excuse for power restructuring?

Environment and Energy in North America

Session Co-Chairs: Rafael Fernandez, PEMEX-Mexico and Jean T. Bernard, Universite Laval

- Present energy/environmental state of affairs under NAFTA
- U.S. energy policy and growing environmental concerns
- Looming regional environmental challenges

Oil and Gas in Mexico

Session Co-Chairs: José A. Ceballos, PEMEX and Roberto Osegueda, PEMEX

- Oil and gas reserves
- Natural gas supply-demand balance
- PEMEX strategic plan 2003-2011

Role of State Owned Utilities in North America

Session Co-Chairs: Andre Plourde, University of Alberta and Daniel Reséndiz, CFE

- Present role of state owned utilities (SOUs)
- Obstacles/opportunities created by SOUs
- SOUs' role vis a vis private enterprises

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

6-8 August 2003, COAL-GEN at Columbus, OH. Contact: Conference Coordinator, USA URL: www.coal-gen.com

17-20 August 2003, Energy 2003, Real World - Real Solutions at Lake Buena Vista, FL (Orlando). Contact: Joann Stirling, Conference Coordinator, Florida Solar Energy Center, 1679 Clearlake Road, Cocoa, FL, 32922, USA. Phone: 321-638-1014. Fax: 321-638-1010 Email: joann@fsec.ucf.edu URL: www.energy2003.ee.doe.gov

3-6 September 2003, International Training Program on Utility Regulation and Strategy at Gainesville, Florida. Contact: Sanford Berg, Director, Public Utility Research Center PURC, PO Box 117142, Matherly 205, University of Florida, Gainesville, FL, 32611, USA. Phone: 352-392-6148. Fax: 352-392-5090 Email: purcecon@notes.cba.ufl.edu URL: www.purc.org

11-12 September 2003, 23rd Annual Bonbright Center Electric and Natural Gas Conference at Atlanta, GA. Contact: Office Coordinators, Bonbright Center Energy Conference, Terry College, 278 Brooks Hall, Athens, GA, USA. Phone: 706-542-1964. Fax: 706-542-8374

15-16 September 2003, 2nd Annual Aboriginal-Energy Partnerships at Hyatt Regency Calgary, 700 Centre Street South, Calgary, Alberta. Contact: Graham Christison, Marketing Coordinator, The Canadian Institute, 1329 Bay Street, Toronto, Ontario, M5R 2C4, Canada. Phone: 877-927-7936 x404. Fax: 877-927-1563 Email: graham@canadianinstitute.com URL: <http://www.canadianinstitute.com/contentframes.cfm?ID=2218>

October 7, 2003 - November 7, 2003, Energy and Power Risk Management Training at Houston. Contact: Chris Edmunds, Risk Water Group, New York, USA. Phone: (212) 925-6990 Email: cedmunds@riskwaters.com URL: www.riskwatersevents.com/energycredit2003

8-10 October 2003, Hydrogen Infrastructure Investment Roundtable II at Denver, CO. Contact: Conference Coordinator, Montreux Energy LLC, 700 17th St, Ste 1950, Denver, CO, 80202, USA. Phone: 303-534-0193. Fax: 303-534-0195 URL: www.montreuxenergy.com

9-10 October 2003, Developing a Sustainable Water Management Strategy at Hyatt Regency Calgary, 700 Centre Street South, Calgary, Alberta. Contact: Graham Christison, Marketing Coordinator, The Canadian Institute. Phone: 877-927-7936 x404. Fax: 877-927-1563 Email: graham@canadianinstitute.com URL: www.CanadianInstitute.com

19-21 October 2003, Integrating the Energy Markets in North America: Issues & Problems, Terms & Conditions at Camino Real Hotel, Mexico City, Mexico. Contact: David Williams, Executive Director, USAEE/IAEE, 28790 Chagrin Blvd., Ste. 350, Cleveland, Ohio, 44122, USA. Phone: 216-464-2785. Fax: 216-464-2768 Email: usaee@usaee.org URL: <http://www.usaee.org/energy/>

30-31 October 2003, Energy Risk Management: Assessment & Mitigation at Houston. Contact: Jeff Kaminski, Euromoney Training- Americas, 225 Park Avenue South, New York, NY, 10003, United States. Phone: 212-843-5225. Fax: 212-361-3499 Email: jkaminski@euromoney.com URL: <http://www.euromoneytraining.com/c.asp?CID=700>

3-4 November 2003, North American Gas Strategies Conference at Calgary. Contact: Paula Arnold, Manager, Corporate Communications & Conference, Ziff Energy Group, 1117 Macleod Trail SE, Calgary, AB, T2G 5M8, Canada. Phone: (403) 234-4279. Fax: (403) 237-8489 Email: paula.arnold@ziffenergy.com URL: <http://www.ziffenergyconferences.com>

17-19 November 2003, World Energy Engineering Congress at Georgia World Congress Center, Atlanta, GA. Contact: Patricia

Munoz, Conference Coordinator, AEE, 4025 Pleasantdale Rd Ste 420, Atlanta, GA, 30340, USA. Phone: 770-447-5083. Fax: 770-446-3969 URL: www.aeecenter.org

17-18 November 2003, 2nd Annual Conference GEPetrol & Oil and Gas in Equatorial Guinea 2003 - USA at Houston, USA. Contact: Kate McHugh, Miss, CWC Associates Ltd, 3 Tyers Gate, London, SE1 3HX, UK. Phone: +44 20 7089 4200. Fax: +44 20 7089 4201 Email: kmchugh@thecwcgroup.com URL: <http://thecwcgroup.com/conferences>

17-21 November 2003, Export & International Project Finance in the Energy Sectors at New York. Contact: Jeff Kaminski, Euromoney Training - Americas, 225 Park Avenue South, New York, NY, 10003, United States. Phone: 212-843-5225. Fax: 212-361-3499 Email: jkaminski@euromoney.com URL: <http://www.euromoneytraining.com/databasedriven/coursedetail.asp?busareaid=3&CourseID=160>

20-22 January 2004, Distributech at Orlando, FL. Contact: Jennifer Lindsey, Conference Manager, PennWell Global Energy Group, 1421 S. Sheridan Rd, Tulsa, OK, 74112, USA. Phone: 918-832-9313 Email: dtechconference@pennwell.com URL: www.distributech.com

Brown (continued from page 12)

natural gas price shocks would be less than those from oil price shocks alone.

11. See Brown and Yücel (1995).

12. Natural gas is the principal feedstock for ammonium nitrate, a basic ingredient in fertilizer. Foreign producers with access to lower priced natural gas gain a competitive advantage when U.S. natural gas prices rise. Natural gas is also the principal feedstock for the U.S. petrochemical industry, while foreign competition primarily uses petroleum as its feedstock. When U.S. natural gas prices rise relative to the oil price, domestic petrochemical producers are placed at a competitive disadvantage. Natural gas is one of many fuels that are used to generate electricity, but it is the fuel of choice for most peaking facilities—that is facilities that meet transitory spikes in electricity demand. Consequently, high natural gas prices can raise costs for an electric utility and its customers. Aluminum production uses considerable energy both directly and through the consumption of electricity. The industry generates some of its own electricity with natural gas. Combined, these factors make the aluminum industry relatively sensitive to natural gas and electricity prices.

**Conference Proceedings on CD Rom
22nd North American Conference
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