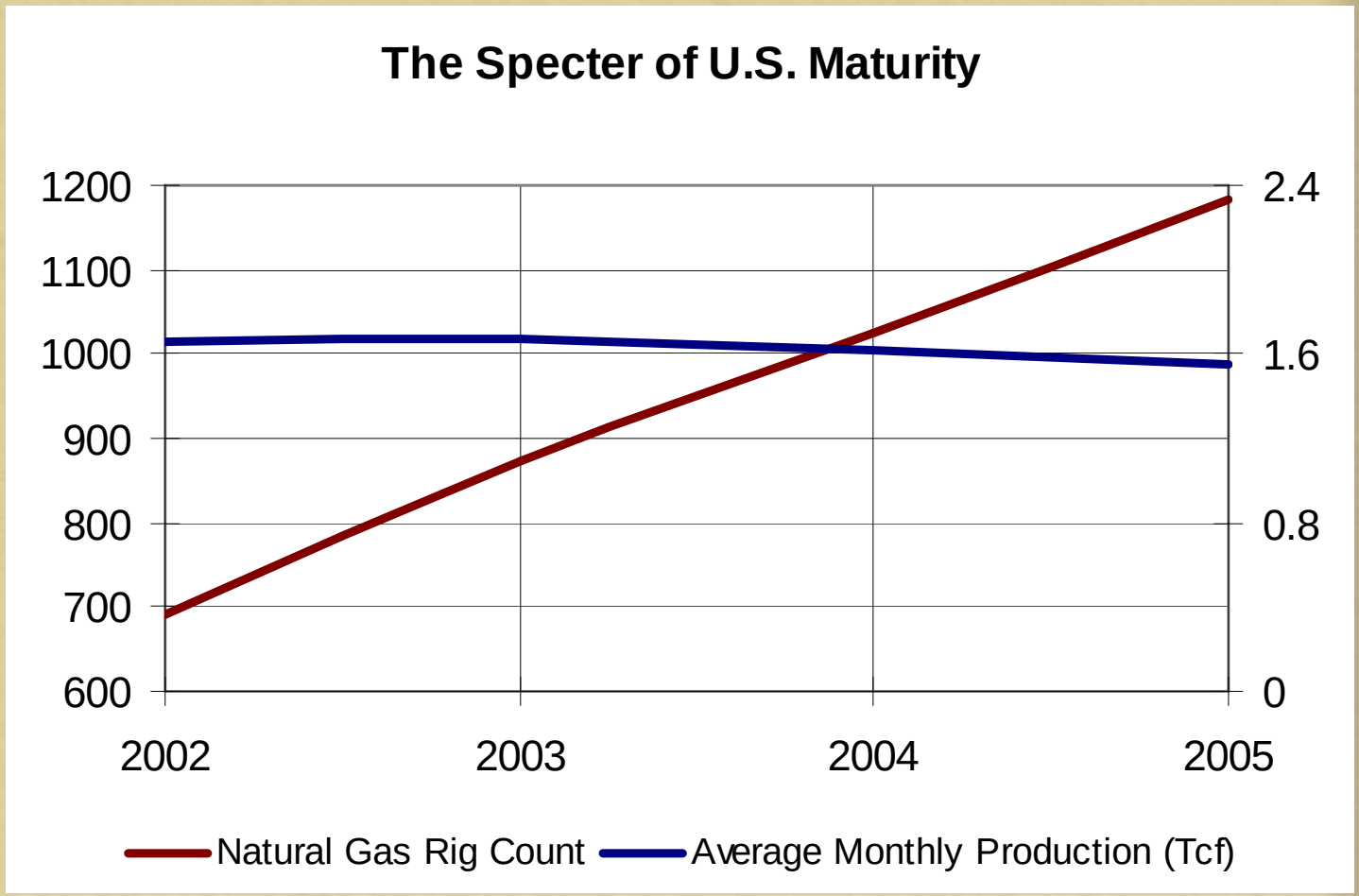
Energy Geopolitics

Michael J. Economides

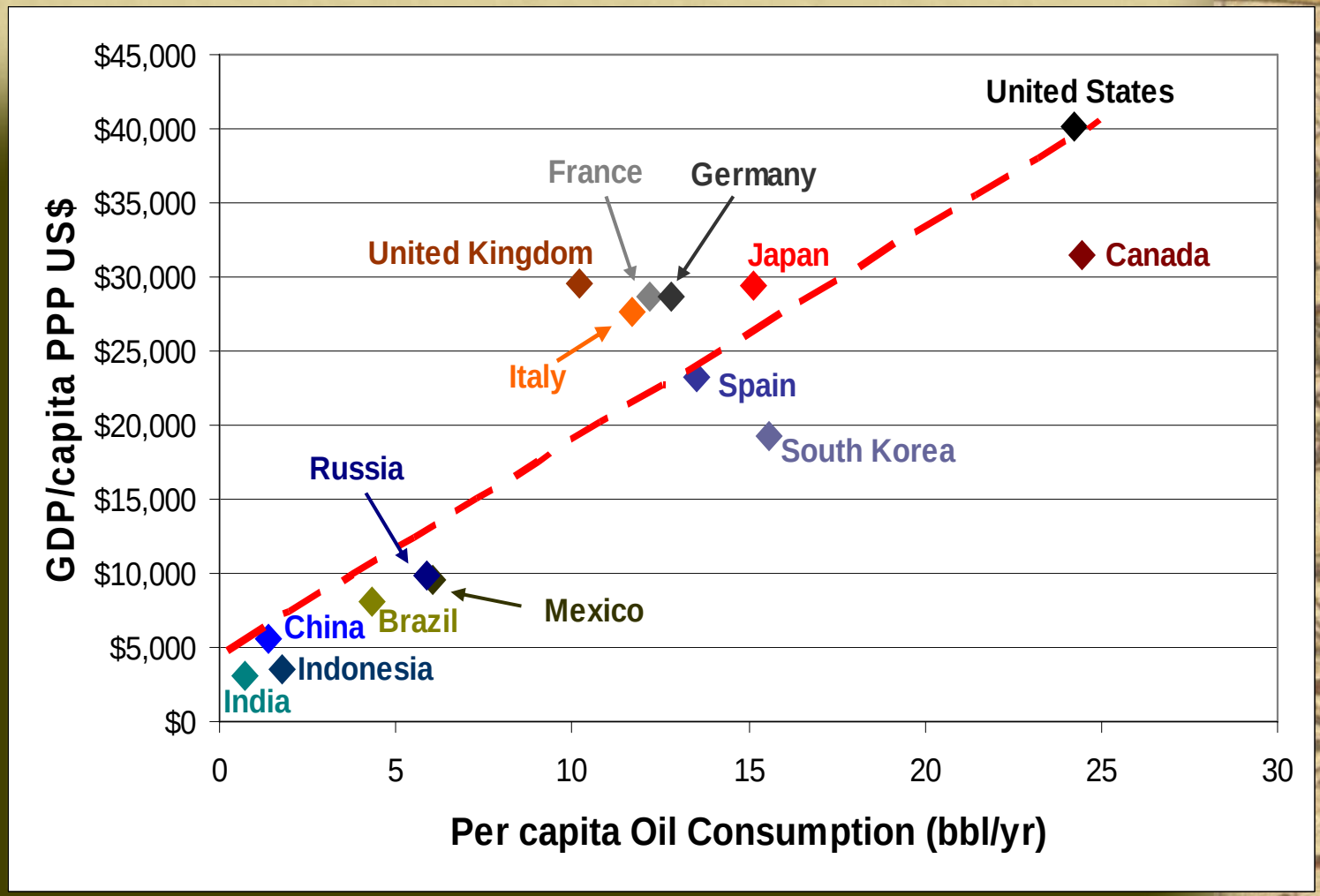
The Continuous Energy Crisis of the 21st Century

- ✓ **Oil over $70 (It is not OPEC and not Katrina)**
  - ✓ **OPEC has no excess capacity "behind the valve"**
    - ✓ **Let's "blame refining capacity"**
  - ✓ **Venezuela, Nigeria, Iraq**
  - ✓ **China has gone berserk**
- ✓ **Natural gas at $16-plus (Over and over again)**
- ✓ **"It will hit $20 soon"**

Why US drilling is ineffective



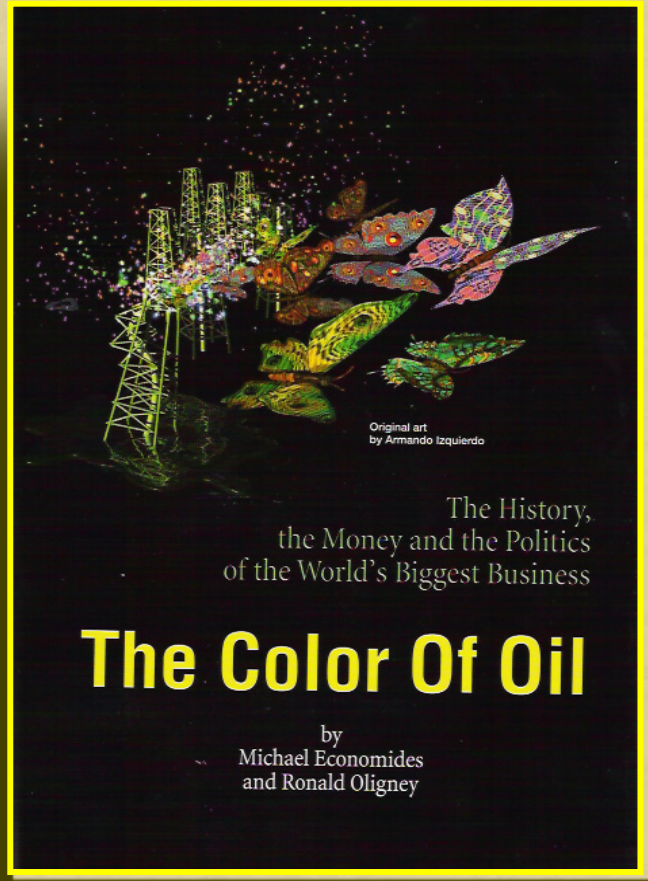
Energy Consumption as an Indicator of the Wealth of Nations



2004 UN HDR, EIA Country Briefs

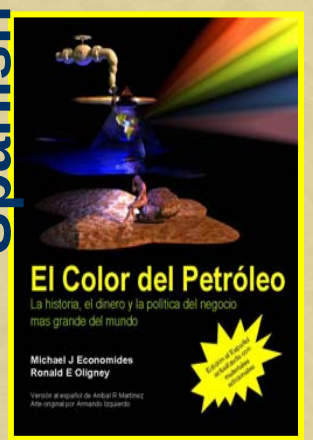
The Color Of Oil

NOW IN 5 LANGUAGES



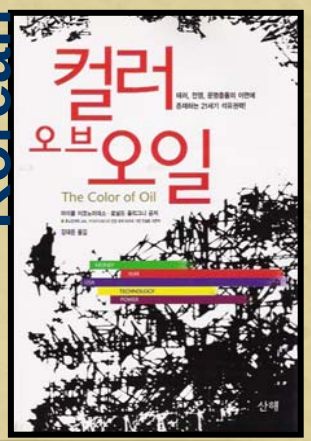
Russian

Spanish



Chinese

Korean



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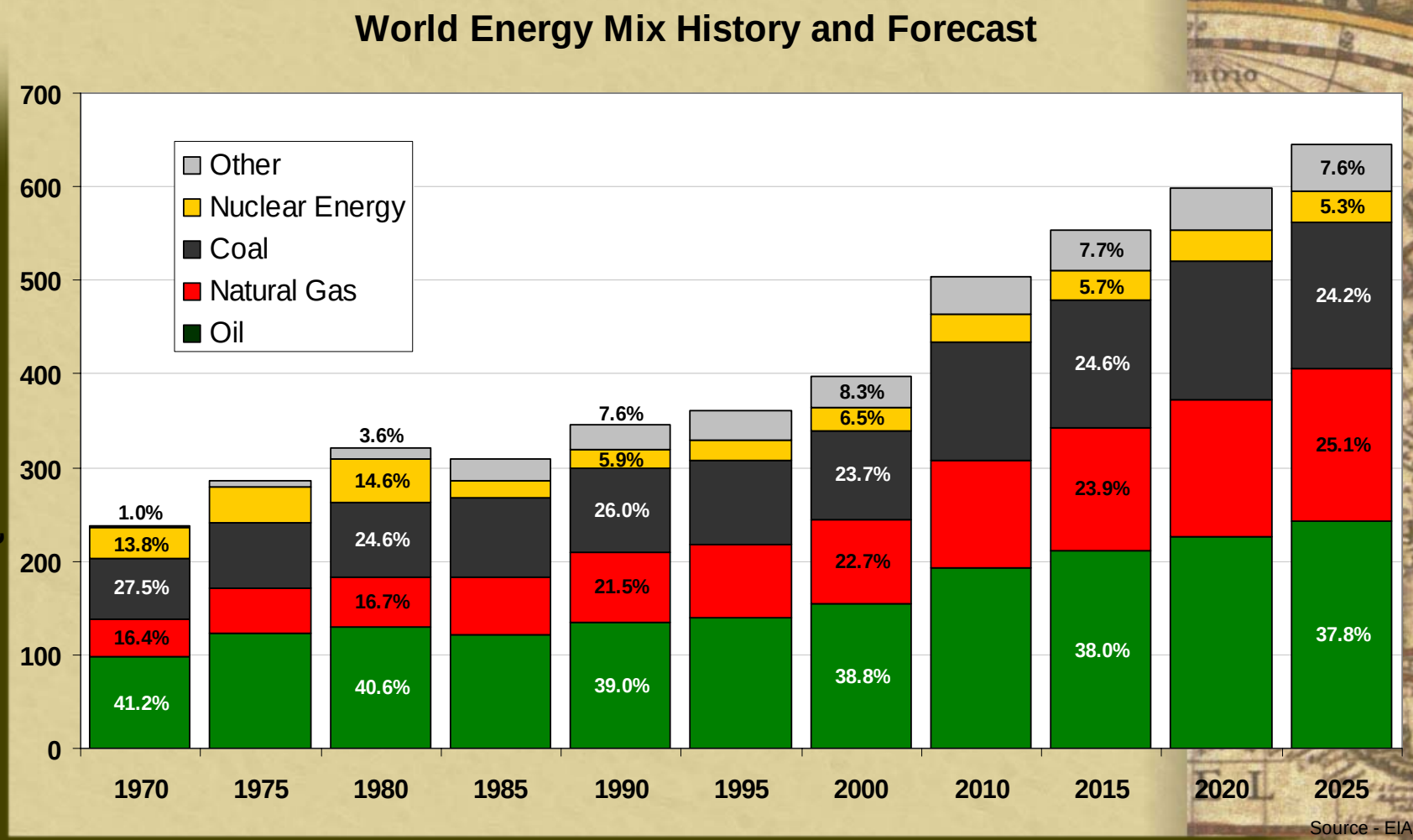
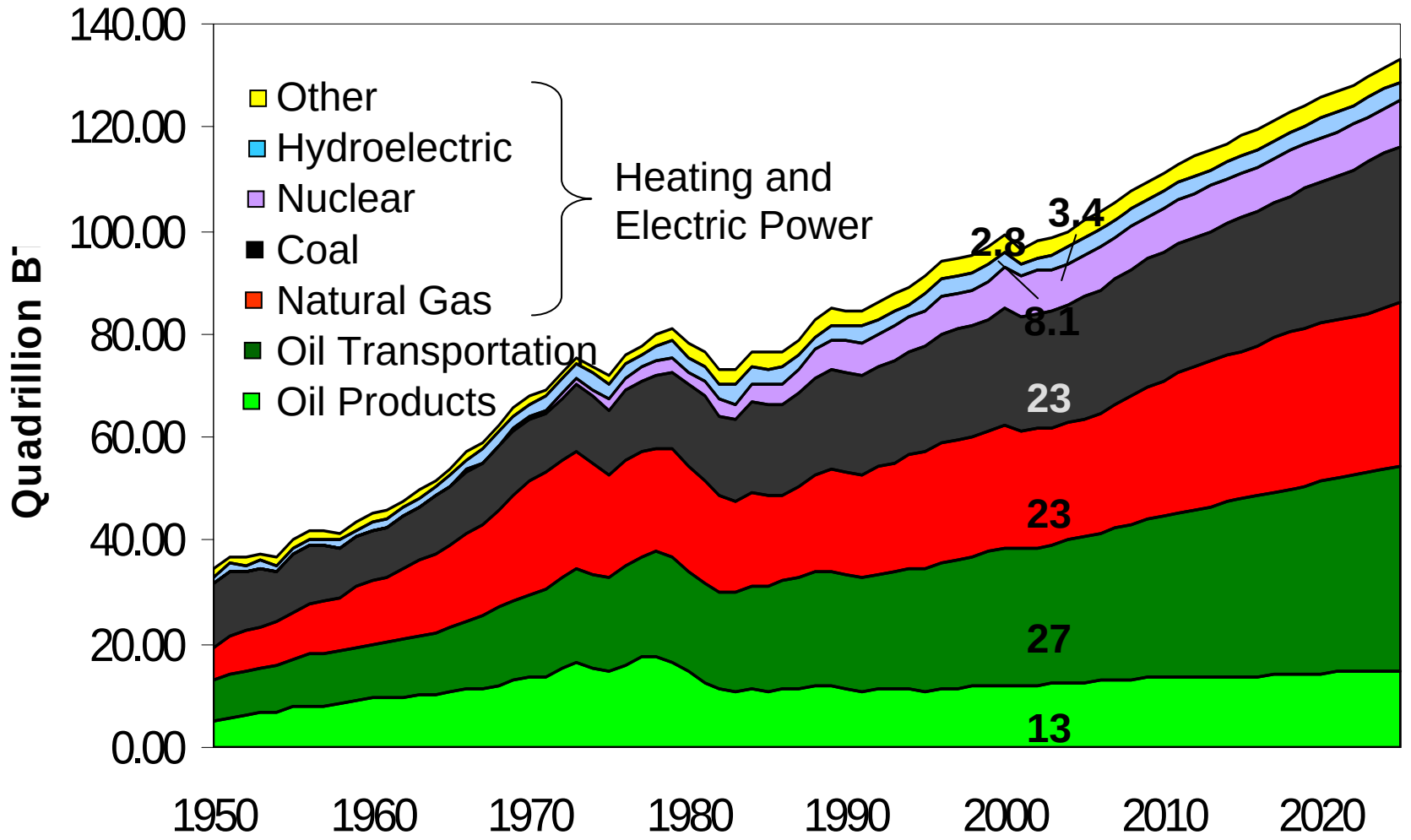
World Energy



Source - EIA

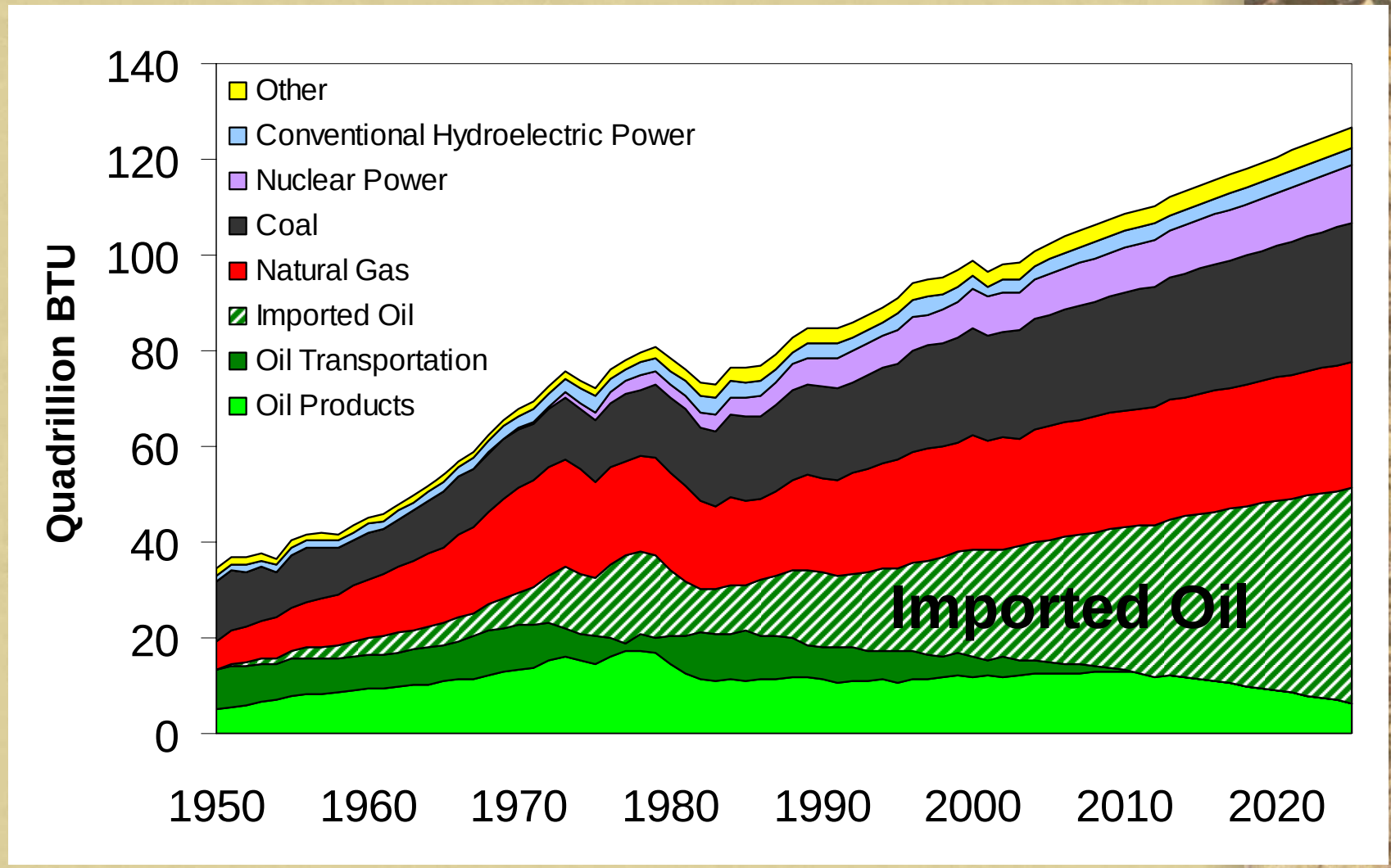
US Energy Consumption



Presidential Candidate on *Meet the Press*, Sunday, April 18

"I'm going to move the United States of America towards energy independence. I'm going to set a goal, that by the year 2020, 20 percent of our electricity will be produced from alternative and renewable sources."

Transportation Oil Dependency



We'll be looking at $50 oil, and likely by next winter

■ The candidates don't have workable plans and things will only get worse

By MICHAEL J. ECONOMIDES and RONALD E. OLIGNEY

THE price of oil is not going down. Oil is trading at the highest levels in a decade, just months after OPEC's grandiose announcement that it would increase its quota by 2 million barrels a day.

Expect oil to flirt with $50, creeping up to that level next winter, once OPEC's impotence becomes apparent. There should be no illusions after the past few years. The oil cartel has been

ity of most OPEC governments. The infrastructure in almost all OPEC countries is woefully outdated and obsolete, a process that dates back 25 years and has accelerated dramatically since 2000.

Social and political strife in Venezuela and Nigeria, the ongoing grind in Russia, not to mention how far awry Iraq has gone (didn't we go there for the oil?) all bode for a problematic future for oil prices, markets and oil supply.

And this is not the worst of it.

The price of oil will climb to $50 overnight if a terrorist attack in Saudi Arabia threatens oil production in a big way. Make no mistake: Islamist terrorists know the impact of such an attack.

If most people think that there is a high likelihood of a 9/11-type attack to hit the United States, they should be certain that the terrorists

four years ago is now tilted toward supply shortages. This will not go away, no matter what.

True equilibrium pricing for new global oil exports is now nearing $30 a barrel.

The nation must recognize this. If there is one real shortcoming of the Bush administration, and one that history will not look too kindly upon (remember this was supposed to be the "energy administration") it is that it has not yet passed an energy plan.

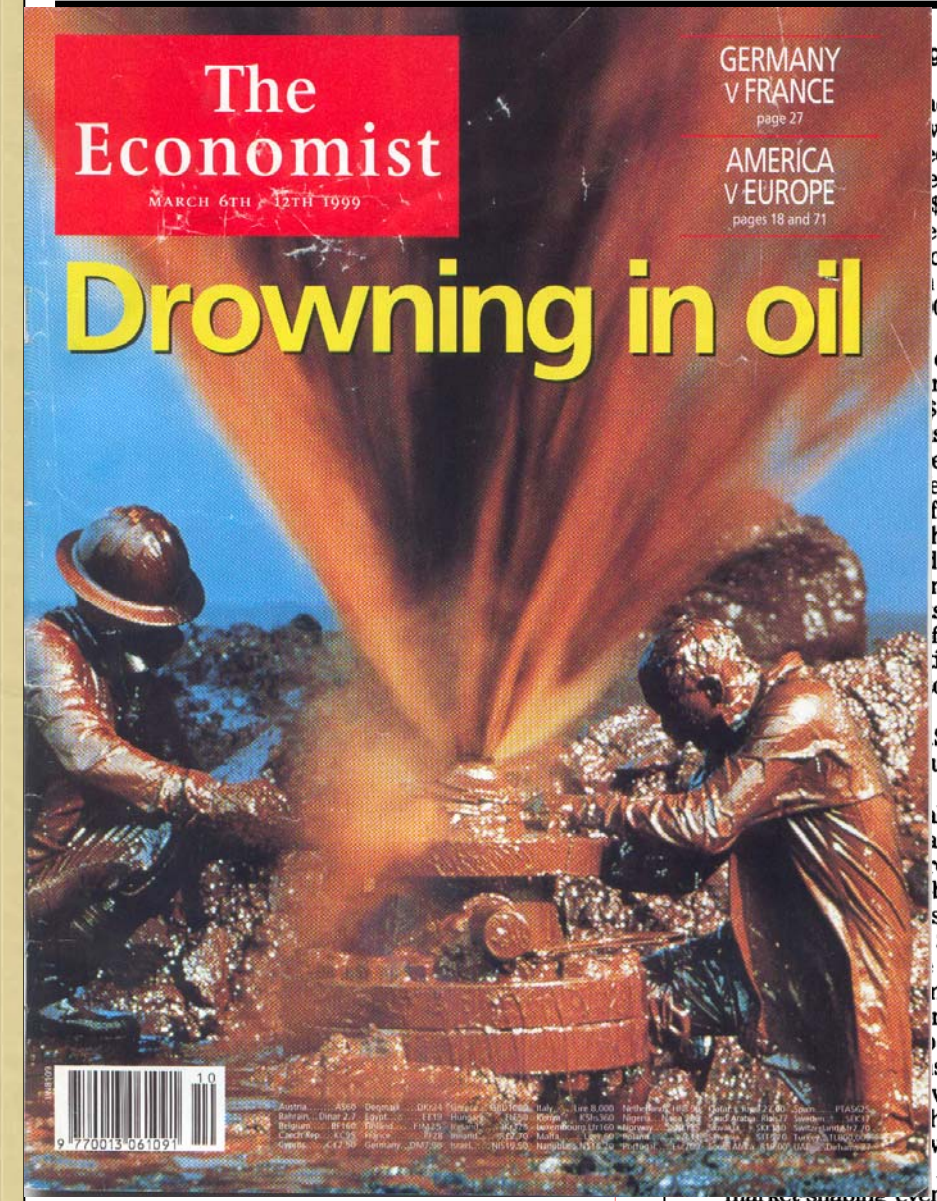
Nor has it been able to articulate to the American people the importance that energy and energy abundance have on the well-being of the country and the lifestyle we enjoy. Transition to other energy sources, primarily natural gas and coal-fed zero-emission energy plants, should be the highest of priorities, but little has been done.

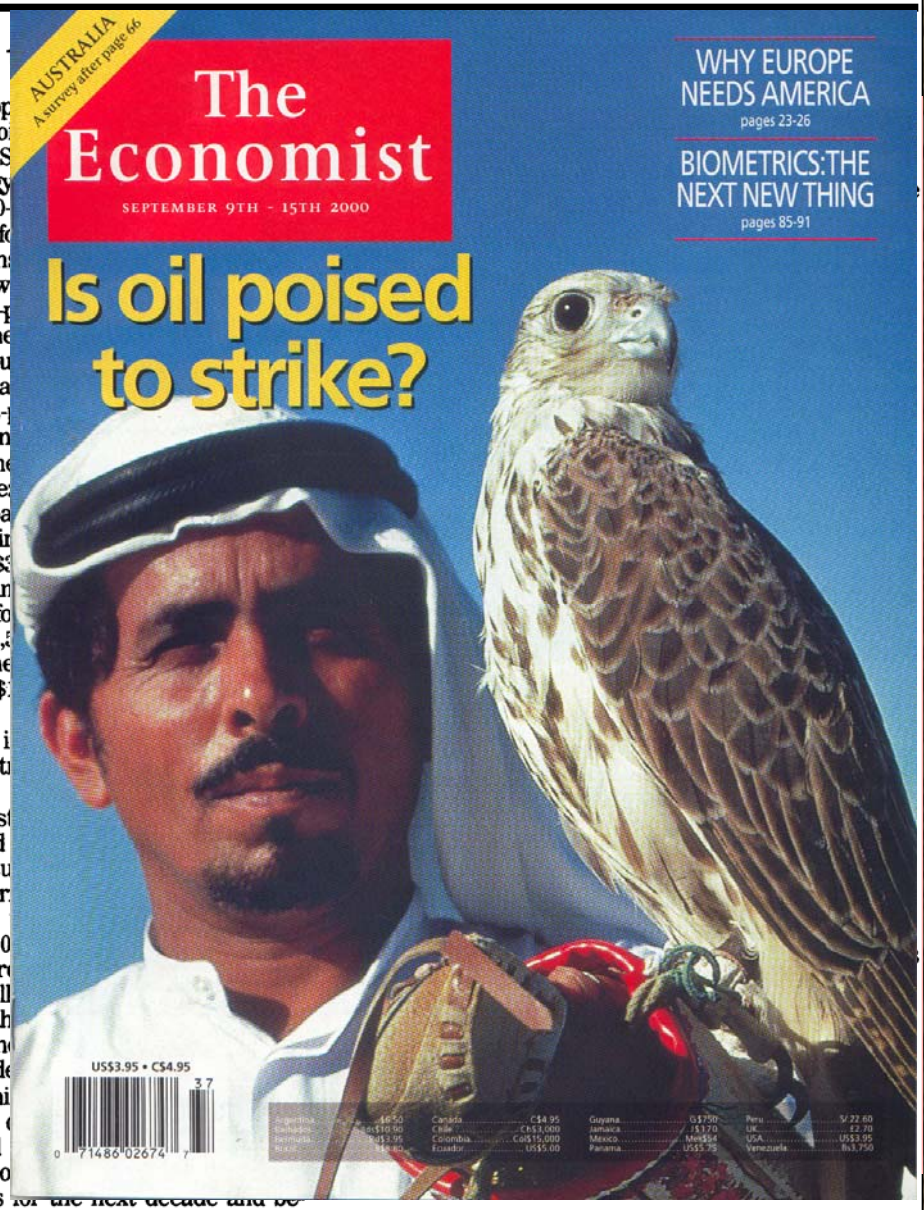
John Kerry is no better and in many ways is

Houston Chronicle
Section C ★★
Sunday, April 4, 1999

OUTLOOK

Editorials & Opinion





See OIL on Page 4C.

yond.

THE NEW YORK TIMES, SUNDAY, JANUARY 9, 2005

DANIEL ALTMAN

Behind the Bouncing Ball of Oil Prices

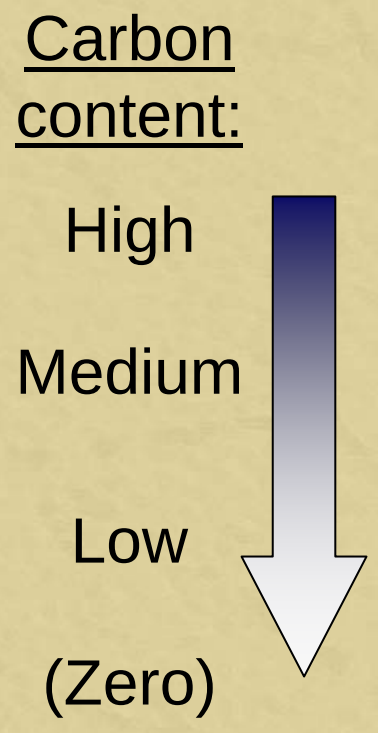
The future price of oil is a topic on which very intelligent, well-informed people can have completely different views. Michael J. Economides a professor of chemical engineering at the University of Houston who has advised Russian oil companies, predicted this week that oil would soon sell for more than $100 a barrel. Frederick P. Leuffer a senior managing director and senior energy analyst for Bear Stearns, forecast that oil would average just $25 a barrel in 2005.

The Energy Prices that People Would Pay

- How much would people pay for gasoline during the exodus from Louisiana and Texas?
- How much would Californians pay for electricity during the blackouts that are certainly coming to that state?
- You cannot regulate price, for the good of consumers, and then deprive them of the energy that they would be willing to buy at prices higher than those set by the government that is supposedly protecting them.

The New Energy Economy

- Wood (1800s)
- Coal
- Oil
- Natural Gas
- Hydrogen (envisioned)



Increasingly:

- Clean
- Energy intensive
- Technologically sophisticated
- Distributed

Energy

Renewable hydrogen may be 'grown'

Bloomberg News

LONDON — A clean, low-cost and renewable source of energy may be generated by making hydrogen fuel from plant material, a study in last week's edition of the journal Nature says.

The process converts sugar from plant materials like corn into hydrogen that could power energy-intensive consumer needs, according to study author Jim Dumesic, a chemical engineer at the University of Wisconsin at Madison.

Hydrogen is a power source for fuel cells, batterylike devices that convert hydrogen and oxygen directly into electrical energy with little or no waste. Hydrogen production is energy intensive, making fuel cells expensive to operate, Dumesic said.

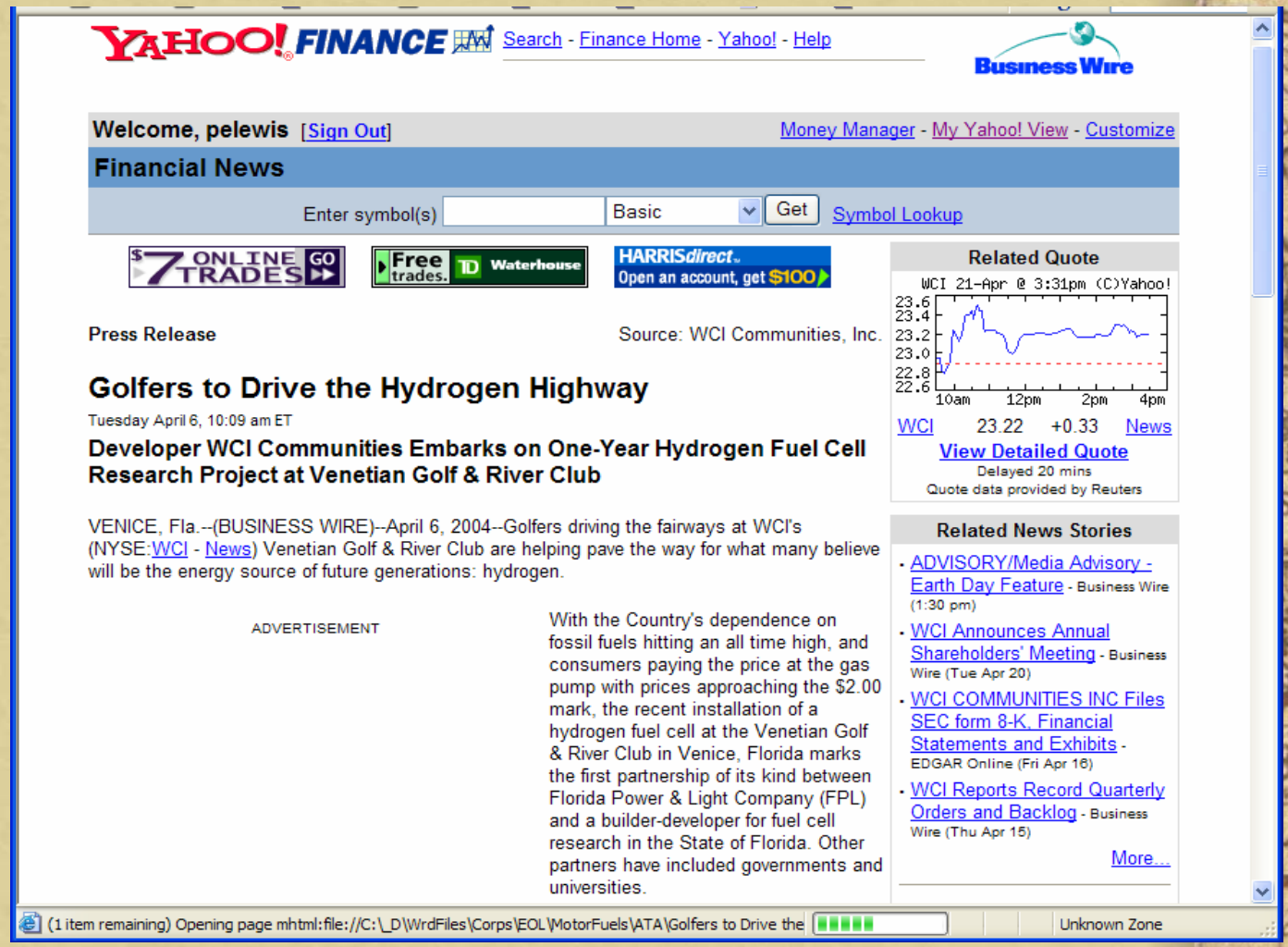
"Right now, most of the hydrogen from fuel cells comes from petroleum," he said. "We're looking at making hydrogen from renewable resources, like corn stalks."

If it works, it would be possible to get large amounts of a clean, energy-rich fuel from waste plant products, such as tons of leftover sugar cane, weeds and wood, and even from such animal byproducts as cheese whey.

Dumesic and his colleagues have devised a way of getting hydrogen from vegetable matter by heating it to about 437 degrees, about 720 degrees lower than current methods of hydrogen production. The process produces only small amounts of carbon monoxide, which degrades fuel cells Dumesic said.

A number of automakers have built or are planning prototypes powered by fuel cells.

Golfing for Hydrogen



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Press Release Source: WCI Communities, Inc.

Golfers to Drive the Hydrogen Highway

Tuesday April 6, 10:09 am ET

Developer WCI Communities Embarks on One-Year Hydrogen Fuel Cell Research Project at Venetian Golf & River Club

VENICE, Fla.--(BUSINESS WIRE)--April 6, 2004--Golfers driving the fairways at WCI's (NYSE:WCI - News) Venetian Golf & River Club are helping pave the way for what many believe will be the energy source of future generations: hydrogen.

ADVERTISEMENT

With the Country's dependence on fossil fuels hitting an all time high, and consumers paying the price at the gas pump with prices approaching the $2.00 mark, the recent installation of a hydrogen fuel cell at the Venetian Golf & River Club in Venice, Florida marks the first partnership of its kind between Florida Power & Light Company (FPL) and a builder-developer for fuel cell research in the State of Florida. Other partners have included governments and universities.

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More...

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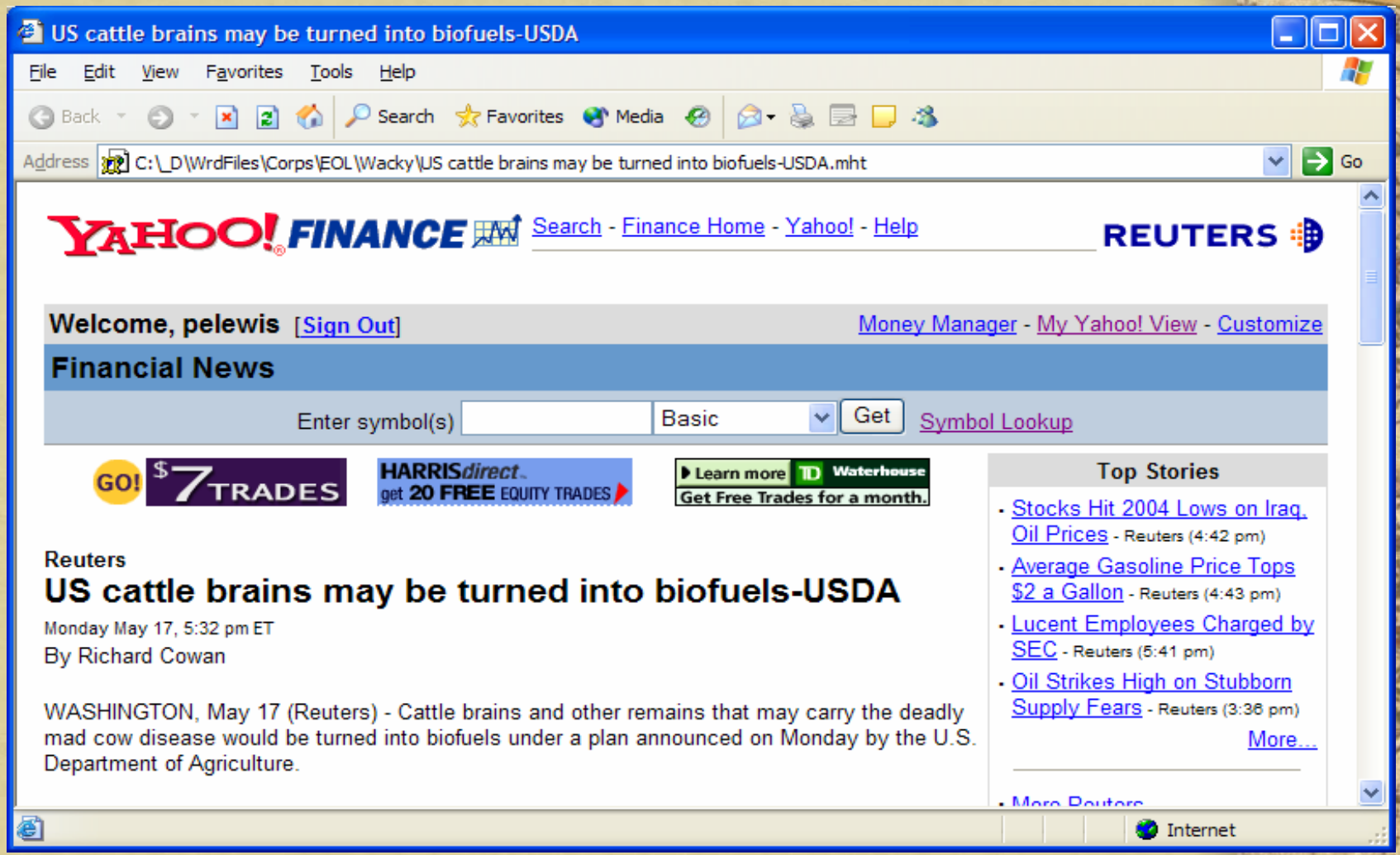
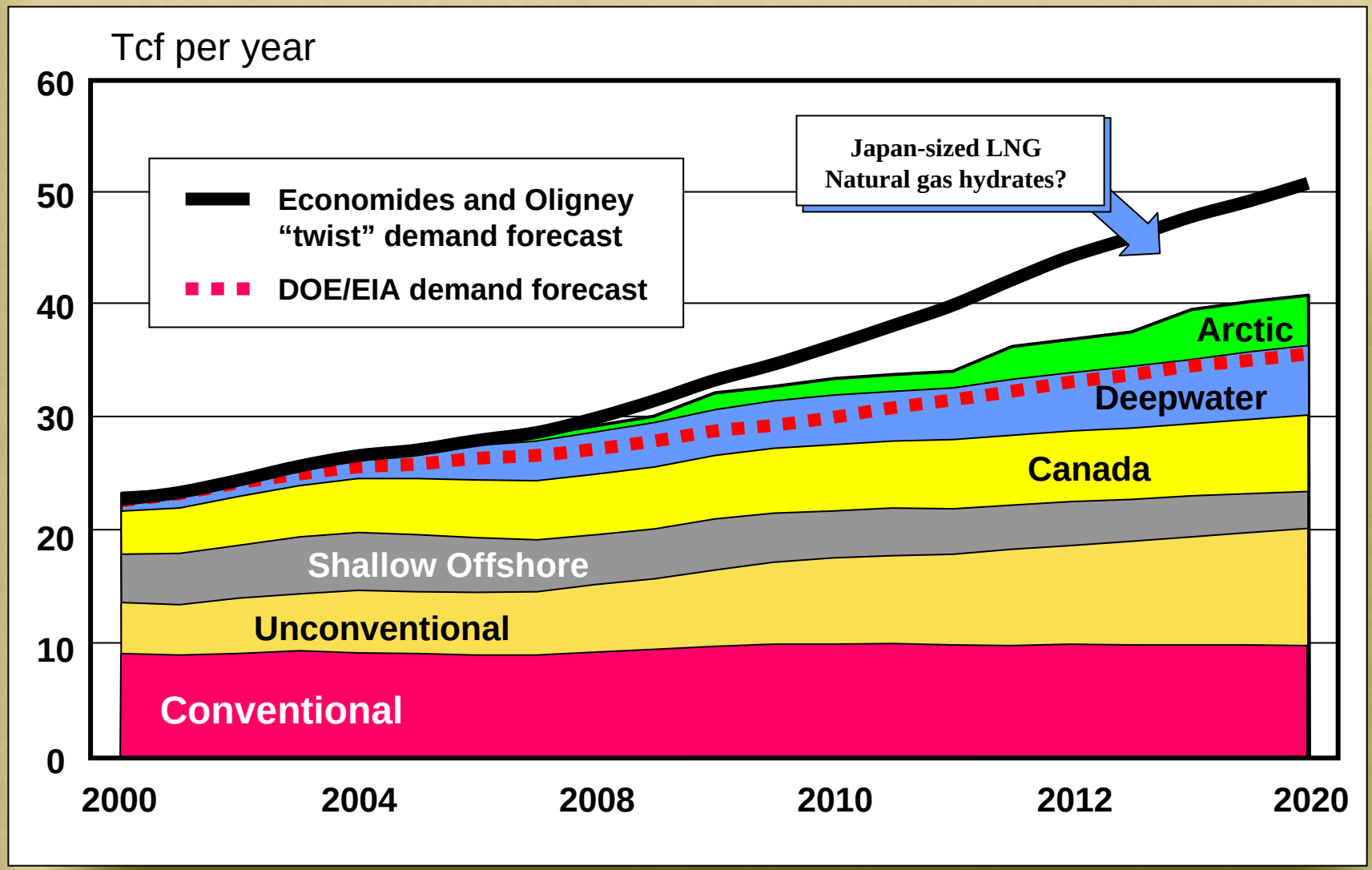
Bovine Brain Power > Mad Car Disease?




There are no alternative
to hydrocarbon energy
sources in the
foreseeable future

U.S. Natural Gas Demand and Supply Sources



Corpus Christi LNG Terminal


Solar, natural gas, wind, hydrogen.
And oh yes, oil.
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"Oil is old news. It's time for a new era. It's time for new technologies."

▲ Fumi Bankole / Math Teacher

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It's a start.

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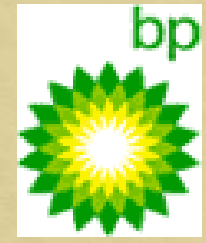
Group Income Statement

For the year ended 31 December 2003



$ million

	Note	2003	2002
Turnover		236,045	180,186
Less: Joint Ventures		3,474	1,465
Group Turnover	1	232,571	178,721
Replacement cost of sales		202,041	155,528
Production taxes	2	1,723	1,274
Gross profit		28,807	21,919
Distribution and administration expenses	3	14,072	12,632
Exploration expense		542	644
		14,193	8,643
Other Income	4	786	641


ΠΟΛΕΜΟΣ ΠΑΝΤΩΝ ΠΑΤΗΡ

The Middle East

The Washington Post

How Will We Manage the Oil?

By Michael J. Economides

Sunday, February 9, 2003; Page B07

"Whoever conquers a free town and does not demolish it commits a great error and may expect to be ruined himself."

-- Niccolo Machiavelli, "The Prince," 1513

With war against Iraq now almost certain, and assuming that we are still a country that abides by the rule of law, it is worth remembering that "legality of the war is irrelevant to effectiveness of the governing law." The 1969 Vienna Convention, which the United States prominently signed, describes the rules that a "belligerent occupier" must follow in administering an occupied territory. They are a far cry from Machiavelli's famous quotation.

This becomes important because of the accusation -- often repeated by Iraq and many others, including close allies of the United States -- that the purpose of the war is to take control of Iraqi oil. Such an act would in fact be a war crime, and avoiding it would be a formidable task, when one considers the Iraqi petroleum potential, oil's unique position in the Iraqi economy and the importance of reasonably priced oil to our own economy.

This is why past and present senior U.S. military commanders have voiced skepticism not about the result of the war, which is all but certain, but for what comes after. Occupation and subsequent management of a country are a hugely difficult problem.

This is what the Vienna Convention requires from the belligerent occupier: "The occupant must continue orderly government and may exercise control over and utilize the resources of the country for *that* purpose and to meet his own military needs."

"Services may be requisitioned, but workers cannot be forced to operate against their country, and are limited to providing *local needs. They cannot be used for the general benefit of the occupier's homeland*."

The words I emphasize are critical. Part of Iraqi oil can be used to pay for the occupation's military cost, but the rest of it must be used strictly for the benefit of the Iraqi people and the reconstruction of the country.

The meaning of this is simple; its accomplishment will be a nightmare. The United States military and the government back home, with a presumably uncooperative Iraqi population, at least at the beginning, and with many oil wells undoubtedly damaged by the war or premeditated sabotage, will have to quickly become one of the largest oil companies in the world.

It's hard to manage an oil company in the most peaceful of times and with some of the most skillful managers. Doing this right in the postwar Iraqi environment will be a breathtaking achievement. The fact that about 20 countries, from Russia to France to China, have interests in Iraqi oil production exacerbates the situation further. This situation will create economic, legal and technical problems, which have hardly been debated as the war drums deafen us.

How will we run the Iraqi oil industry, which we must do, as it is the only income source for that population? Will we increase production by using technology not currently available because of the sanctions? Will we produce more oil to lower world prices, benefiting the United States and the rest of the developed world, already in a prolonged economic downturn, or will we produce less, for example obeying OPEC quotas, benefiting the Iraqi treasury, whose well-being will become our responsibility as the occupier?

There are even more vexing questions beyond the macroeconomic issues. Will our Iraqi oil managers choose drilling targets in difficult geologic structures currently impossible in a constrained Iraqi oil industry? Will they use complex wells, stimulation, drilling and measurement technologies? And would all this optimization and engineering fly against the Vienna Convention, which seems to suggest maintaining production without further exploitation, which would seem and indeed be for the benefit of the occupier?

And there is a final issue. Who will do all this? Petroleum engineers and roustabouts recruited from Houston, Midland and Oklahoma City, along with a sprinkling from Aberdeen, Scotland?

The 1991 Persian Gulf War had the fig leaf of respectability under the U.N. umbrella. Getting the Iraqi army out of Kuwait was easy, a discernible aim and painless. No war was declared and the niceties and ethics of modern warfare and behavior did not have to be tested. To invade Iraq, occupy it and manage it afterward is another matter, and I can only hope that the U.S. government, in addition to the military operations plan, also has a petroleum management plan.

The writer is a professor at the Cullen College of Engineering at the University of Houston and author of "The Color of Oil."

Energy Geopolitics

The Axis of Energy Militants

- Iran
- Venezuela
- Russia under Putin

- The quagmire that is Iraq

- China

RUSSIA

Messy Road to Energy Dominance

By Michael J. Economides and Ronald E. Oligney

MOSCOW — As Americans worry about Middle East oil supplies, a much bigger energy drama is playing out in Russia. That country now produces about as much oil as Saudi Arabia, exports about 4 million barrels a day and is unabashedly moving toward increasing production. When this is considered alongside Russia's probable dominance in the natural gas market over the coming decades, it becomes apparent that the most radical energy realignment in the world since the creation of OPEC and the 1973 Arab oil embargo is underway.

But the road to energy dominance is not proving an easy one. Late last month, the government of President Vladimir V. Putin arrested oil magnate Mikhail Khodorkovsky on charges of fraud and tax evasion. Last week, the government impounded his shares — some 44% of the total — in the country's largest oil company, Yukos.

With a net worth estimated at $8 billion and labeled by some as "Russia's Bill Gates," Khodorkovsky was allowed during the Boris Yeltsin era to purchase Yukos for a relatively small sum in a controversial 1996 privatization deal. In recent months, ExxonMobil and ChevronTexaco have been among the U.S. oil companies bidding furiously to acquire a piece of Yukos.

Speculation is rampant about the government's motivation in arresting Khodorkovsky. The Yukos chief had made his interest in reforming Russia's political structure apparent. He donated large sums to opposition parties, and he has been mentioned as a possible presidential candidate. One theory is that it was these political actions that prompted his arrest. Others speculate that the move is part of a government bid to renationalize the energy industry.

Whatever the reason, the Khodorkovsky arrest complicates Russia's energy future. The country's ascendancy in the energy world has been an important counterbalance to the power of the Organization of Petroleum Exporting Countries. Many in the West hoped it would also point the way to a new-style Russian economy and society.

Two decades ago, the Soviet Union's overreliance on oil revenues for foreign currency contributed to its demise. The oil price collapse of the mid-1980s, following deliberate overproduction by Saudi Arabia, caused many internal fractures in the Soviet regime to become gaping holes, in part because of the country's almost exclusive dependence on oil revenues for hard currency. Some have worried that, in the wake of a collapse in the industrial sector after the fall of communism, Russia is now more dependent than ever on oil. But oil is only half of the story. The bigger Russian future is natural gas.

Gradually, over the last 15 years, the world — led by the United States — has moved toward making natural gas its fuel of choice. This is proving to be a revolutionary, though technologically disruptive, transition. But the benefits will prove considerable. Natural gas is a far more efficient and cleaner fuel that lends itself to the miniaturization of the engines it powers. It has a large role to play as we attempt to wean ourselves from carbon fuels.

There are many signs of this shift, the most obvious being that nearly all of the power plants planned or under construction in the United States will run on natural gas. There is little chance that renewable energy like wind and solar power will play a significant role for decades, and perhaps not even then. Consequently, the United States will soon become a massive importer of natural gas in the form of liquefied natural gas.

With by far the world's largest reserves, perhaps as much as 40% of the recoverable natural gas on the planet, Russia will be in the driver's seat for generations to come. China, conveniently on Russia's border, has increased its energy demand by an astonishing 110% in the last decade, and its needs continue to rise.

All of this adds up to one thing: Russia's dominance in energy. That is why the world will be watching closely as Putin moves forward — both with his prosecution of Khodorkovsky and with his country's move to exploit its considerable energy reserves.

Michael J. Economides is a professor at the University of Houston and is chief technology officer of the Texas Energy Center. Ronald E. Oligney is director of the center. They are co-authors of "The Color of Oil: The History, the Money and the Politics of the World's Biggest Business."

Christophe Vorlet *For The Times*

Will China Break Through?

China vs US Consumption

- In the last decade China's oil consumption increased by 3.5 million barrels per day, the largest in the world by far.

- If China were to use the same per capita consumption, as the US, it would require 80 million barrels per day (more than the entire world use.)

China and Russia

- Energy will be China's choke point
- Has become recently very assertive, if not belligerent.
  - Sudan
  - Canada
  - Venezuela
  - Even USA: CNOOC hostile bid for Unocal
- China's energy future passes through Russia….CNOOC "interest" on Yukos