Our Energy Crisis: Is It Real?

How Does It Get Resolved?

CONOCO SENIOR MANAGEMENT RETREAT

Scottsdale, Arizona

March 11, 2001

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It is an honor to be the opening speaker at your senior management retreat. I have long had great admiration for Conoco. This is partly because Conoco sent me my very first credit card when I graduated from college. In Utah, Conoco had a great image and I was extremely proud to have this first badge of "credit." Moreover, I used a lot of your gasoline!

Conoco has a long and distinguished history. It was also one of the first dominant oil companies to "disappear" as it, along with so many other great names in the industry were acquired. But fortunately, Conoco also became the first to "come back!"

As I was preparing these remarks, I thought back to a conversation I had two years ago with Frank McPherson (one of my favorite people in the industry) on a jeep during a quail hunt at the King Ranch. I had just gone on the board of Kerr McGee, Frank's old company. He was asking me about "mega-majors" and how important I thought it would be for oil and gas companies to become large enough to survive and also prosper in the 21st Century. I responded that a company the size of Kerr McGee was still ideal. It was just a drill-bit away from a new discovery that would give the company one more year of production growth. When you become the size of a mega-major, you end up being merely ten drill-bits away from this "holy grail" which is the only way to ultimately add value in the E&P business.

I then said, "In my opinion, a company like Conoco is as large as you want to get. Any larger and it is almost impossible to grow production. When I said this, I had no idea that Frank was on Conoco's Board!

Conoco is well placed to address the great energy challenges of the coming decade. The company has a great image, a terrific management team, and great assets. You also have the resources to tackle any realistic energy project you want to pursue. So adhere to your present course. All of you are doing a great job.

SCOPE & CHALLENGES

Let me outline what I hope to address this evening. I will attempt to put our energy problems into some context for your senior management retreat. When discussing energy, too many people merely think oil. Tonight, I would like to cover all three energy sources: oil, natural gas and electricity.

It is now becoming critical to "connect the dots" and understand how each energy source is created, all the way from the energy resource to the point it is consumed. It is also becoming increasingly important to understand how each of these three primary energy sources inter-relate.

I will begin my remarks on the U.S. electricity market, then switch to North American natural gas, and finish with worldwide oil. I will then make some comments on what this all means for future energy prices and conclude with a glimpse of the energy challenges we will face in 2010 and beyond. The subject of energy is complex and also extremely important. There might be a world "beyond petroleum" as Sir John Browne would like some people to think, but there is not even a concept of a world "beyond energy." And

there is no economy, be it a new, old or even futuristic that would exist without reliable, accessible and affordable energy.

U.S. ELECTRICITY

Let me begin by discussing electricity, the least understood but most critical of all our energy sources. The U.S. highway fuel market totals 11 to 12 million barrels per day, making it the single largest petroleum market in the world. However, primary electricity, the energy content going into the creation of kilowatts in the U.S. is almost twice as large. The fact that electricity consumption (site electricity) is only one-third this size speaks volumes about electricity's complexity, its mysteries, its energy inefficiency and its pollution emissions.

Since kilowatts were first discovered, the sheer complexity of the business dictated that it was conducted in a highly regulated market. The presumption was that electricity was both too important and too complex for the unregulated private sector to get the job done properly. It was deemed simply too difficult for an unregulated free market to calculate the critically important spare margin capacity. It was further deemed too complicated to figure out how to always ensure more generation was added in time to keep this margin intact, as it takes a comfortable amount of spare generation capacity to ensure no electricity shortage. All of these factors are also important for oil and gas but in the kilowatt world, with no stocks of electricity working storage, when you are out – YOU ARE OUT!!! It only takes a nano -second of demand exceeding supply for wire meltdowns to occur, creating blackouts that take a long time to fix.

As all the energy markets moved into a total spot market pricing mode and free market deregulation, the electricity players and regulators decided that it was time for the tightly controlled kilowatt world to also embrace this same spot market mentality. So the electricity world began lurching, or inching, (depending on what part of the system you were watching) into this new and untested world of free market deregulation. (Whether this turned out to be a mistake might be debated for years). So far, the experiment has not worked quite the way everyone thought it would. The problems were many. A brief list starts with:

- Electricity Data. It is simply awful. I have been a pronounced critic of the many deficiencies embedded in the country's petroleum data. But even the worst of our petroleum data begins looking faultless compared to our data on kilowatts. When Non-Electric Utilities ("NUG's") began manufacturing kilowatts, the energy statisticians failed to properly capture these statistics. The error created a very misleading sign that demand was slowing down. This was a colossal mistake. There was no slowdown. It turns out that electricity demand is the most resilient of all forms of energy. From the end of World War II to the start of the 21st Century, residential and commercial electricity use increased 52 out of 53 years. Industrial demand growth occurred in all but six years. Over the past 30 years, U.S. electricity demand increased even on a per capita basis. But, bad data produced an inaccurate roadmap so stealth demand devoured our invaluable generation reserve.

- Rather than slowing down, electricity demand either stayed constant or even began to increase. A widespread use of air-conditioning and "gadget proliferation" sustained a steady 2.7% to 3% growth while apparent demand

was thought to be slowing to 1%. And this was before exploding Internet use acted like an after-burner on this growth. Unusually mild weather further masked an underlying growth in kilowatts that was not slowing down but actually beginning to speed up.

- In a world of such growth, generation additions began slowing way down. The poor financial returns new facilities would experience, the lengthy time it took to get new power plants sited and then built, the confusion of pending deregulation, the false premise that deregulation would open up gobs of spare generating capacity in "the neighbor's back yard" and errors based simply on the poor demand data all combined to cause America's steady program of building new power plants gradually to grind to a halt.

- Generating capacity in 1980 totaled 630 gigawatts. 73% of this capacity was actually being used. By 1990, we had 780 gigawatts of kilowatt generation with 80% being used. By the end of 1999, only a fraction more generation was added and the end of 1999 we were using 95% of the existing base. Accidentally, we used up almost all the generation margin which took years to create.

- We began to have occasional signs that all was not right in the kilowatt world. In the summer of 1998, the first dangerous regional blackout occurred when a mass of hot, humid weather settled over the Midwest. In the course of a few hours, electricity prices in Ohio and neighboring states rose from $30 to $7,500 an hour! In the summer of 1999, the U.S. experienced 28 discreet "electricity events" ranging from days of rolling brownouts to some very

serious blackouts. The flashing yellow lights were going off everywhere but most went unnoticed.

In 2000, the East Coast had only 2.5 days of summer that occurred during the second week of May. And for 2.5 days, rolling brownouts were commonplace.

Given the generally mild weather on the Pacific coast, California was one of the least likely sites for our U.S. electricity crisis to finally erupt, but it had to start somewhere. As California's summer began, its two largest electricity providers were AAA rated credits. By Labor Day, a Wall Street Journal article warned that both could soon be close to insolvency. Within months, this prediction became an economic reality.

Despite suffering through electricity problems for over six months now, there is still massive confusion about what happened in California and how serious and permanent the state's problems really are. Many still think that California's problems are simply an example of poor deregulation. I would argue that the state's flawed deregulation is like a poorly designed cast for an already broken arm.

Is this problem limited to California? No. Once summer weather begins, assuming summer is hot, we will probably see the problems of California worsen and spread further to various other parts of the U.S.A. We used up most of the spare generating capacity we once had and perhaps all the spare transmission capacity as demand never slowed but began speeding up.

The magnitude of the looming problem will simply be a function of how hot the weather is (and how fast the economy grows.) But, the potential exists for a giant problem and large blackouts could last longer than hours or even days.

Texas may be the only safe market if our feedstock is sufficient to both power our rapidly expanding power plants and also export natural gas to the rest of the country. Luckily, Texas, so far, has ample spare electricity capacity.

There is a correction to having no extra capacity. The solution is “on the way” -- America is adding new gas-fired power plants at an unprecedented rate. So far, over 200,000 megawatts of new gas fired power plants are on order. 25,000 were hooked up in 2000. Another 35,000 to 40,000 megawatts of new power plants are scheduled to come on stream in 2001.

The blizzard of new orders has created a lot of industry confusion and the debate now ranges around whether we will end up with a “Tsunami of Kilowatts” which CERA predicted last fall, or, barely enough to sustain current kilowatt growth.

There is a question as to whether much of this unprecedented backlog of new power plants are “double orders” or not enough.

There are troubling signs that electricity transmission capacity is in even worse shape than generation. But a lack of meaningful data on the kilowatt transmission system makes this issue almost impossible to properly analyze.

In perfect world, we will solve this serious electricity problem, even if it takes a serious amount of overbuilding to correct. The biggest obstacle or flaw to solving our electricity crisis brings me to the second part of my energy discussion: North American natural gas.

NORTH AMERICAN NATURAL GAS

It turns out that we bet the U.S. ranch on natural gas being an abundant and dependable resource. We failed to connect the dots between natural gas resources and access to such resources and the amount of new rigs, pipelines, and people to get the job done.

Last week, the DOE held an extremely important two-day workshop. They invited a group of about 50 key executives involved in creating last year's important National Petroleum Council's study on the long term future for natural gas to assemble in Washington for two days to begin benchmarking and testing all the key assumptions buried in the NPC report. By the start of the second day, one of the DOE consultants produced graphs that summarized the findings of our first day. The critical factors are summarized in a handful of bullet points:

- Access to gas resources has become more difficult.

- Technology progress has not occurred. Instead, we are falling behind.

- Capital constraints – internal cash flows being absorbed by increased capex, prices and taxes paid on record profits as a result of high gas prices but so far, there is little access to external capital for most independents who create most of our natural gas reserves.

- Skilled workers have become a serious constraint at all levels. There is no solution in sight – too many boom/bust cycles could prove to be a permanent personnel deterrent.

- Rigs are now in short supply. This is a constraint that emerged 5 to 7 years sooner than expected in the NPC model.

- Lead times for drilling sites and pipeline additions are getting worse.

- On the demand front, GDP growth is way ahead of the model's assumptions. But more shocking is what is happening to gas-fired plant additions. By mid-2002, the U.S. will be at a level that the NPC model assumed would be added by 2010!

- None of these new power plants are being built with any fuel switching capacity. This fuel switching was a key assumption used for gas prices to stay under $3 forever. Anytime the model indicated gas prices exceeding $3, oil got dumped into these new turbines as a fuel substitute.

- There is much confusion about how many of these new power plants are being added are for simply peaking needs versus forced into becoming "defacto" base load plants.

- On supply side, so far, there has been "no drilling response." Supplies were supposed to be up. Instead, so far, they are down. Much time was spent discussing "is supply help around the corner?" Accordingly to the economists present – YES. According to the geologists – NO!

- Some harsh geological realities limiting the supply for natural gas were shared at the workshop attended by both Dick Sharples from Anadarko and Mike Webb from Kerr McGee. According to a "Sharples' gas supply model", our current 50 bcf per day production base will be down to 25 bcf a day by 2005. What this means is that we have to add half of our current production base merely to stay flat.

- There are too many signs that rapidly rising decline rates created a treadmill that required drilling an exponentially higher number of added wells.

By the time this session ended, there much concern was expressed. All 50 participants shared their individual concerns about natural gas' future during the latter part of this two-day session. The discussion swung back and forth between near term, mid-term and long-term issues. My expressed concern was what would happen to natural gas storage over the next 4 weeks. As of a week ago, storage was only 28 bcf above the all time end of winter low. This record will be shattered in the coming week with several weeks of cold weather yet to occur before spring finally arrives. Unless cold weather

ends quickly, we are clearly headed towards 500 – 600 bcf before the re-injection season begins.

Once mild spring weather arrives, the industry will embark on a mad scramble to refill the storage system. But calculate the numbers and a best case is reaching June 30th with approximately 1 to 1.3 tcf in storage, a level equal to that of what we previously ended the winter. Then summer weather begins!

If the summer is hot, particularly throughout the eastern portion of the U.S. where humidity also is an accompaniment, we could easily see days, if not weeks, where demand for gas to run electricity-powered air-conditioning is so high that there is no gas available for injection. Given the record number of new power plants that could be hooked up by then, we could possibly even see a period of summer natural gas storage withdrawals.

According to the current construction schedule, 55,000 megawatts of new gas-fired capacity will be added over an 18-month period by the start of the summer. On hot days, this creates the need for an additional 6-bcf to10 bcf of natural gas use per day.

Generating so much added use either wipes out industrial use (6.2 bcf/day) or what daily storage injection averaged last year (7.5 bcf/day).

What this all means is that we risk draining the entire natural gas storage system over course of next 2 to 3 years. If this occurs, some draconian steps need to be taken, such as restricting the use of natural gas during all shoulder months in order to replenish storage.

As the nation anxiously watches for the overdue arrival of a supply response for more daily natural gas, someone needs to work on a contingency plan. If there is no supply response, or worse, a possible supply reduction, an action plan needs to be in place. Here are some of my suggested steps:

- Arctic natural gas supply takes on a new urgency, and thought needs to be given to the need for **2 pipelines**, not one. 4 to 5 bcf per day is "puny" when the nation needs to find ways to increase our 60 bcf/day gas needs by 30% while the current base rapidly declines.

- There is also a need for rapid LNG expansion on both coasts, along the Gulf of Mexico, and south of our border too.

- Deepwater gas takes on an even greater urgency and the technical barriers to extracting associated gas from deepwater oil need a rapid resolution.

- We need some ingenious deep drilling initiatives so the drill bit can penetrate formations deeper than 15,000 vertical depths, a territory where few bits have ever reached. These are complex wells to drill and they are extremely costly. But before this activity can even get cranked up, there is a need for massive expansion of the deep, high horsepower land rig fleet, and someone needs to solve the riddle of how we get new people to enter the drilling business. These wells are too complex to be drilled by prison parolees.

- The problem with all these solutions is that they take time to get implemented. Most take a long time, perhaps even a decade. In the meantime, the country risks entering a period when we have both natural gas and electricity rationing.

- The reason this is a genuine risk is that the other forms of adding more kilowatts to the American electricity grid, i.e. coal, hydro, and nuclear – all now operate at close to 100% utilization 16 hours per day for most of the year. We are essentially out of spare energy capacity.

- There is nothing more likely to stop economic expansion dead in its tracks than an inability to expand our electricity and natural gas needs.

This brings me to the final part of my energy discussion, the worldwide oil markets.

Is this the only part of our energy supply with spare energy capacity or could the oil system now be just as unstable as the other two?

GLOBAL OIL

Oil is global in scope so any discussion of its spare capacity shifts from a U.S. or North American basis to a worldwide issue.

The definition of spare petroleum capacity varies – it should not, but it does. When you are on the verge of spare capacity, the only definition that has any real meaning is "Behind the Well Head Valve". The fact that someone has added proven reserves that require more wells to be drilled becomes irrelevant if pending shortages loom.

We all need to remember that the two oil shocks on the 1970's each lasted less than 90 days. But both became sea-change events.

When Saudi's oil minister publicly states that the Kingdom has about 1.8 million barrels a day of spare reserves that could be added in "around 90 days", I would take him at his word and also assume that no one in the OPEC world has any significant "behind the valve" capacity left.

Even if the world has an added 1 or even 2 million barrels of spare wellhead capacity left, none exists in any magnitude outside Saudi Arabia. Worse still, we no longer have any significant spare capacity in tankers, no spare refinery capacity in most parts of the world, no spare pipeline capacity, no tank farms.

Liquidating oil stocks has now become the last swing producer in the global oil system. Over the last decade, we have taken 20 days out of system. 5 days of this shrinkage came in the last 24 months.

The oil system is tight. In light of such tightness, it is surprising that there is still such mass confusion in the oil markets.

U.S. crude stocks have fallen to all-time lows. This has been blamed on two weeks of dense fog in the Gulf of Mexico. Only last week did commodity traders begin questioning whether this was the real cause. It could not have been. The culprits were simply refiners buying too little foreign imports as the system now needs close to 10 million barrels a day to balance the stocks. Any less creates a stock drain.

OPEC is now set to cut more oil supply from the market to minimize the risk of a new oil price collapse. As they contemplate these cuts, the IEA warns that OPEC is being reckless and greedy. Yet the IEA's supply/demand numbers for oil show a massive daily glut of 2 million barrels per day. But this glut has never materialized so we now have "Missing Barrels" - Round 2. Almost 400 million barrels of oil have now gone AWOL!!

Is the world's oil supply responding to these surprisingly high oil prices? Or, could we now be overstating actual supply? According to both the EIA data for the U.S. and the IEA data for the world, supply is responding. But according to the production reports of almost all publicly held energy companies, daily oil production is still declining.

Could we be imagining the same "good news for the oil consumer" as we did with natural gas? Step back and look at a few facts. Numbers often tell a far different story than anecdotes. Here are some important facts to consider:

- What happens to oil demand when the price of oil rapidly rises? Does demand growth suddenly stop like so many economists now believe?

- Between 1973 and 1979, the price of oil soared but demand for oil also rose by 8.8 million barrels per day. From 1979 to 1983, oil demand fell by 7.2 million barrels per day in the OECD, but it rose in the rest of the world. We will never know how much of the OECD decline was due to $30 oil or the awful fear that future prices were headed to over $100 a barrel.

- The fall in oil demand did not last forever. In fact, it only lasted five years and bottomed in 1983. Over the next 17 years, oil demand grew by 22.9 million barrels per day excluding the astonishing one-time collapse in the FSU.

- Over the past 30 years, what happened to the developing countries' oil demand? Since 1970, it fell only once, by 100,000 barrels a day between 1979 and 1980. In the 29 other years demand grew, despite wild price swings and economic turmoil in many of these tiny countries during most of these three decades. Overall oil growth in the developing countries of the world enjoyed a 30-year growth rate which averaged 4.0 % per year.

What happened to oil supply over this same 30-year period? Non-OPEC supply soared, growing by 16.6 million barrels per day between 1974 and 2000. But 52% of this gain was over by 1981. Another 26% happened by 1990. In the next five years, non-OPEC supply grew by only 500,000 barrels per day. Supply apparently grew another 3.1 million barrels a day from 1995 through 2000. But these recent supply numbers are likely off by approximately one million barrels per day.

The change in the most recent IEA supply estimates, which are almost undoubtedly too high, show a production gain, outside OPEC, between 1999 and the first quarter of 2001 (IEA numbers) totaling 1,750 million barrels per day. 42% of this gain came from the FSU, which has the most flimsy petroleum statistics in the world. 14% comes from Norway which is unsustainable, given Norway's lack of recent exploration success and rapidly rising decline rates. 14% comes from Brazil, 11% from the U.S.A, another number that is hard to believe, since so few publicly traded oil producers are showing any U.S. oil production gains. 10% comes from Australia. The balance, or a grand total of 150,000 barrels a day, comes from 30 other countries, despite having the highest oil prices in twenty years.

Is something far bigger going on in the world's oil supply? Could rising decline rates end up plaguing future oil supply increases as profoundly as they have North America's natural gas supply? Depletion of the world's oil production base is clearly on the rise, though it probably still lags behind the decline rates for North American natural gas. Giant oil fields are no longer being discovered, and the world's base of existing giant oilfields are all now beginning to roll over.

Look at just a few interesting petroleum facts:

- The last new oilfield producing over one million barrels per day turned out to be the Cantarell in 1976 (and this field now needs an investment of $10.5 billion to prop up its sagging production base.)

- Colombia's Cusiana field was originally envisioned to be another Prudhoe Bay at the end of 1989. Instead, it became the only oilfield outside Saudi's Shayba field to

exceed 400,000 barrels per day. It peaked at slightly over this level before daily production fell. The field has already declined over 30%.

- Through 2005, not a single new oilfield is projected to produce over than 250,000 barrels per day. Only a handful of new fields are projected to exceed 200,000 barrels per day. For an individual company or consortium, 200,000 or 250,000 barrels a day is big but for the total world, this amounts to only 3/10th of one percent of world supply.

- Production throughout the Middle East is rolling over. It is not clear how many of these giant fields are still being choked back. Other than Shayba, there might be none. Iran's Aghajari Field, which experienced peak production of 1 million barrels a day in 1974, and then produced a steady 850,000 barrels per day for seventeen consecutive years, is now going to consume three billion cubic feet of South Pars' gas to prop up production of only 150,000 barrels per day. Whether this is a case in isolation or the future of the Middle East will be a critical issue over the next few years.

While there is a lot of bearish sentiment in the oil markets and too many people hoping that oil prices will soon fall, facts shout out that oil capacity is as tight as natural gas and electricity.

OUR ENERGY CRISIS

The reality is that we have run out of spare energy capacity. We still have plenty of energy. We have enough to allow the world to use over 180 million barrels per day. But having no spare capacity is a genuine energy crisis. Any minor blip or merely a few more quarters of continued energy growth will instantly create a supply shortage. One day, this means electricity blackouts, the next day, a natural gas shortage and then shortages of heating oil or motor gasoline.

There are only two ways to solve this crisis and one is very wrong. The latter is to shrink our economies around the world to once again create spare energy capacity. But this solution also puts an end to economic growth until an economy gets invented that no

longer gobbles energy. The right solution is a massive expansion of the energy complex to create at least 30 % spare capacity. Why so much? It takes just as long to increase energy capacity by 10% and this only buys the world three or four years of growth. Furthermore, while this capacity addition is being built, we also have to rebuild the world's energy base, brick by brick, across the entire infrastructure which allows over 180 million barrels of energy equivalent to be used each day. This program will be one of the world's largest industrial expenditures. I liken it to an Energy Marshall Plan.

I have no idea how costly such a program will be. As I play with a few numbers, the cost quickly reaches a four to five trillion dollar spending program before even beginning to fill in "all the dots."

It will also take at least a decade to get this job done. It might even take close to 2 decades to realize. Hopefully, the energy resource base is in place to safely accomplish this task. But an early step in this arduous task should be a genuine test of this "adequate resource" theory. If any part of the resource base has some genuine physical

limits, it is better to know this now, rather than spending trillions of dollars and later finding the answer is “No.”

In this Energy Marshall Plan, every form of energy has to be expanded. None are so powerful that they “put another form of energy out of business.” And sadly, there are no silver bullets to magically make this problem disappear. Conservation and renewable energy are an important part of this overall plan, but both are simply energy slivers and barely make a dent in solving our energy crisis.

ENERGY PRICES

This brings me to discussion of future energy prices. What will they be? Nobody knows the answer to this riddle until the real cost to accomplish the Energy Marshall Plan is calculated. The biggest danger is for energy prices to return to their historical norms as so many planning models now assume will soon happen. We should all remember that it was these “historical norm energy prices” which led to a decade of awful financial returns throughout the entire energy sector.

Somebody has to fund the Energy Marshall Plan. Until the blueprints for this massive expenditure are complete, no one has any idea how much future energy needs to cost, but it will probably be quite expensive.

It is time for everyone to begin putting energy costs in better perspective. I have read too many statements on how awful residential energy costs now are. In 1997, the average household spent $1,250 per year for its total energy bill. Multiply this by 101 million homes and the total U.S. residential energy cost amounts to $126,250 billion.

In 1998, the U.S. spent 60% more (approximately $202 billion) on consumer advertising, and consumers never even flinched at this huge expense, even though one way or another they pay for it!

American homeowners spent over $30 billion on natural gas. This is a lot of money, but consider this: Box office receipts for movies grew seven fold between 1970 and 2000. Last year, U.S. movie receipts grossed $7.7 billion. Add sports tickets, VHS rentals and

other entertainment costs to this total and American entertainment was probably more expensive than the total residential cost of America's natural gas bill. Which is more critical? I think the answer is easy.

High-energy costs are tough on the poor. But the poor can be subsidized. A $10 a barrel equivalent increase in U.S. energy prices adds over $100 billion to U.S. tax receipts. Some of this "windfall" to our U.S. Treasury could be plowed back to subsidize the poor.

What should future energy cost? Suppose I were to get a telephone call tonight from President George W. Bush, saying "Matt, I have a favor to ask. In one week, I need to advise the G-7 countries what the price of oil needs to be for the next two or three years as we are going to fix this price next week. Can you give me the right number? "

In tackling this task, I would hone in on the real economics for the economy of Saudi Arabia. I would figure out this riddle by calculating the cost to create an economy in Saudi Arabia that is as prosperous in 2010 as a country like Spain is today. Is this too

lavish an aspiration for the world's most important energy provider? After all, Spain is still one of the poorer countries in Europe today. By 2010, Saudi's population will be close to 35 million. If you work up some rough numbers on this, the future price of oil, at least from Saudi Arabia's perspective, needs to be between $35 and $55 per barrel. The range depends on whether Saudi can export 10 or 15 million barrels per day. The higher the export, the lower the number needs to be, but as Saudi Arabia's economy grows, its internal energy use also rises exponentially, so it might be hard to double exports over this same timeframe. This calculation is simplistic but it is more realistic than using a "gut feeling" that oil is likely to be $15 at some future point without a scrap of logic to support such a price.

I obviously have no idea what the real price of oil will be either this summer or in 2010, but these are the hard numbers we should now be analyzing instead of pretending that future energy prices will return to the low levels we burdened the energy business with for too long. The "historical norm" prices of the past 15 years were mere illusions and fooled too many consumers into thinking that future energy would be almost free. The world will pay for this mistake for a long time.

FINAL COMMENTS ON LONG TERM ENERGY ISSUES

Let me close by making a few comments on the worldwide energy long-term outlook, once we complete the Energy Marshall Plan.

The more I study the role of energy, the more profound the issue becomes. Energy really is industrial oxygen. It is the only component of our economy that is a necessity to allow everything else to function. Just like oxygen is to the human body, without it, nothing operates. We can get by without one or another energy component, like oil or natural gas, but not without energy.

In 1935 the world consumed less than 5 million barrels of oil per day. Over the next 70 years, worldwide oil use would grow to almost 80 million barrels a day. At the start of the 1940s, the world only used 30 million barrels total energy on an oil equivalent barrel of energy each day. By the 1980s total worldwide energy demand had grown to over 140 million barrels oil equivalent per day. In 2000, the world used between 180 million

barrels and perhaps 200 million barrels of total energy. The reason for the wide gap is the probably because of double counting of resources like natural gas liquids that make the final total energy number not very precise. Energy growth became the most durable aspect of the 20th Century and was also what underpinned most of our wars.

Will the 21st Century differ? Is this growth over or could it be merely beginning? In my opinion, the biggest long-term threat to future worldwide prosperity is if the world fails to reduce the growing gap between its rich and its poor.

In this context, I find the following energy facts profound and hope all of you will too:

- In 2000, the U.S. used 60 barrels of energy equivalent per person each year. In contrast, 80% of our global population still use only 1/20th of this amount. Two billion people on earth in 2001 still essentially use no form of modern energy. They exist on three sources of energy: charcoal, agricultural residue and dried animal dung. This creates the worst pollution on earth and has to stop, but replacing this with clean, modern energy will be a challenge.

OPEC's population was only slightly above 200 million people in 1970. The population in these same countries is fast approaching 600 million today. Given ever rising birth rates and very young populations in most of these countries, they are likely to reach China's current population by 2030.

We need to begin creating an energy plan for a world that some day will need a total of 300 million barrels of oil equivalent energy each day. Can hydrocarbons get the job done? It is very unlikely, but we have to try. Somewhere down the pike, we need some new forms of energy and many more devices that conserve energy. And these new energy forms need to "scale" to meet the future energy needs of billions of people, not just remote villages or exotic high technology homes.

What does this energy future mean to a company like Conoco as you plan for 2002 and beyond? Be thankful you are so well placed, not too large and not too small of a company. Be thankful you have some solid energy technology expertise like your carbon expertise, your natural gas processing skills, your excellent project management talents and access and ownership to state of the art deepwater drillships.

The future of energy belongs to those who can “connect the dots” all the way from the theoretical resource base to figuring out how to get it out of ground, upgraded to usable energy and delivered to what will be a ravenous energy consuming world!

It has been an honor to address your Conoco’s 200 leaders tonight. You have a great company! Have a successful management retreat. Thank you for your attention to these serious energy matters.