

Roscoe Bartlett
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[GPO's PDF](#)
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The SPEAKER pro tempore. Under the Speaker's announced policy of January 18, 2007, the gentleman from Maryland (Mr. *Bartlett*) is recognized for 60 minutes as the designee of the minority leader.

Mr. BARTLETT of Maryland. Madam Speaker, I believe that this is the 41st

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time that I have come to the floor since 3 years ago, the 14th day of March, to talk about energy, specifically about oil.

Here is a copy of the Washington Times today. The main headline: "Global Food Riots Turn Deadly." And then if I turn to the front page "promo-ing" what's inside, Business, Gas Hits Record: "The upward trend in energy prices showed no sign of abating yesterday as gasoline set another record at the pump and crude oil topped \$112 a barrel for the first time in the futures market."

If I go back to the lead article, it says clashes likely to persist with soaring prices. "Anger over spiraling world food prices is becoming increasingly violent." This is a quote from the head of the Rome-based U.N. Food and Agriculture Organization: "World food prices have risen 45 percent in the last 9 months, and there are serious shortages," serious shortages, "of rice, wheat, and corn. U.N. Secretary-General Ban Ki-moon issued a personal appeal for calm in Haiti yesterday. At least five people have been reported killed in disturbances since last week after the cost of rice doubled and gas prices rose a third time since February."

This could have been predicted 28 years ago. I will explain in a few moments why I use 28 years ago. It was an absolute certainty that at some point in time, roughly this time, that we would be here talking about this crisis.

This first chart is an interesting one. The motorist is looking at today \$3 and 30 some cents a gallon for gasoline, and he says, "Just why is gas so expensive?" He has a tiny little supply there and a huge, big demand in his SUV. And, Madam Speaker, that's why gas prices are high. There is more demand for gas than there is gas available, and the marketplace demands that the price of gasoline go up.

This saga started 52 years ago, the 8th day of March, in San Antonio, Texas, when what I believe will be recognized shortly as the most important speech given in the last century was delivered to a group of oil scientists and engineers and executives in San Antonio, Texas.

The next chart shows the prediction that was made in 1956 by M. King Hubbert, who was this oil geologist. He was talking to a group of people representing the country, our country, which was then king of oil, producing more oil, consuming more oil, exporting more oil than any other country in the world. And he told them that in just 14 years, no matter what we did before or after that, that oil production would reach a maximum in our country and after that it would go down, down, down. What he said was audacious and disbelieved, but 14 years later, in 1970, right on schedule, we peaked in oil production.

And this is a chart which shows that peaking. It shows Texas producing a third or so of the oil at that time and the rest of the United States. Natural gas liquids added to that. And then it shows the enormous discovery of oil in Alaska, and I have been there to Prudhoe Bay, Dead Horse, and I have seen the beginning of that 4 foot pipeline through which for a number of years now a full fourth of our domestic production of oil flowed. That is now tapering off.

The yellow there are the fabled discoveries of oil in the Gulf of Mexico. You notice that in his prediction that we would reach a peak in 1970, there was just a blip in the downward slope produced by the huge discovery in Alaska. He had not included Alaska and the Gulf of Mexico in his prediction. It was just the lower 48. And notice there was hardly a ripple of those famed discoveries in the Gulf of Mexico.

The next chart shows another depiction of the Hubbert Peak. And I show this one because this is used by a group, CERA, Cambridge Energy Research Associates, to try to convince you that you should not be alarmed by M. King Hubbert's prediction, that the world would be doing now about the same thing the United States did in 1970 because he was wrong about the United States in 1970. They said, you see, his prediction of what the production of oil would be are these yellow triangles and the actual production were the green squares and he missed it.

Well, maybe a statistician could give you an analysis which could say he had missed it, but I think to the average citizen, those two curves look pretty darn similar, don't they? And I think the average citizen would say I think he probably got it. We did peak in 1970, and in spite of what we have done then, in the lower 48, we pretty much followed that curve.

And then this is the red now. That includes the total production which includes Alaska and the Gulf of Mexico.

In 1979 M. King Hubbert predicted that the world would reach its maximum oil production about now. And the next chart is a very insightful one. If you had only one

chart to use to discuss this subject, this would be the chart that you would use. It shows the discoveries of oil. We discovered a whole lot of it back in the 1940s. I actually remember those times very well. My first car was a 1936 Ford, made just 10 years after I was born. Then lots of discoveries in 1950 and the 1960s and 1970s. And notice what has happened, 1970s, 1980s, 1990s, 2000, down, down, down in discovery. And that's in spite of ever better techniques for finding oil. 3-D seismic and computer modeling and, boy, we've mapped the world, and we know pretty much where oil is likely to be found because it's found in only very unique geologic formations and we know what they are and we know where they likely exist.

Now, the solid black line here is our consumption of oil, and it's also our production because we haven't been storing huge amounts of it anywhere. We have a small strategic reserve in our country, small in terms of the oil that we use in a year, really small. So we aren't storing it anywhere; so what we have consumed is what we have produced. And you see that that shows an ever-increasing slope here.

Up through the Carter years, every decade, we used as much oil as we had used in all of previous history. I want you to reflect on that for just a moment. What that meant was, of course, if we had kept on that trend, when we had used half of the world's oil, and it is finite, and when we used half of the world's oil, we would have just 10 years of oil left at that rate of usage.

Now, in the 1970s, late 1970s, we had the oil price spike hikes as a result of the Arab oil embargo, and that caused a worldwide recession. You see here that the use of oil actually dropped off. It caused a worldwide recession and we woke up. We said we can get things done more efficiently. So now with an increasing economy, greatly increased economy, we are now using oil at an ever less increasing rate. This slope, it's very much less than this slope, and that reflects the increased efficiencies that we have built in. Your air conditioner today is maybe three times as efficient as it was in the 1970s. Your refrigerator is two or three times as efficient as it was then.

Notice that ever since 1982 or so, we have been using more oil than we found. And we were able to do that because we had these huge reserves back here. So what we have been doing ever since the early 1980s is dipping into these reserves and using some of this oil that we found and didn't need because the area under this curve represents the oil that we have used. And, obviously, if you add up all these bars, it represents the oil we found, and you could put a curve over those, and the area under that curve would then represent the oil that we found. So we now have used this area here in terms of our reserves, and we used about this much reserves probably; so we have a whole bunch left.

So what will the future look like? Now, M. King Hubbert predicted that the world would be reaching its maximum oil production about now. And this chart you see at about 2008, 2010, it shows it peaking. Now, you can within limits make the future look reasonably whatever way you want it to look like, but you cannot pump what is not there. If you are really aggressive and build a whole lot of wells and flood them with live steam and pump CO

2 down there and flood them with seawater, which is what they do in Saudi Arabia, you can get the oil out quicker.

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But what you use now will not be there to use tomorrow. How much more will we find? Well, they have shown a smooth discovery curve getting ever less and less. It won't be smooth like that. It will be up and

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down. But if I were drawing a line and projecting it out, I wouldn't have drawn it quite that high. And I don't think you would either. You would draw it somewhere below that. I think that is maybe an optimistic assessment of what we will find in the future if what we have discovered in the past is any measure of what we will discover in the future.

The next chart is a chart which M. King Hubbert anticipated. This is an interesting one because it represents data from the two best organizations in the world for tracking the production and consumption of oil. Because as I said before, we use what we found pretty quickly. We haul it across the ocean, refine it and use it. This is the EIA, the Energy Information Administration, a part of our Department of Energy, and the IEA, the International Energy Association. That one most people are familiar with because El Baradei is the head of that. And they have been kind of monitoring what is going on in Iran. You see them frequently in the newspaper.

Notice that for the last 3 years roughly they show the production of oil as constant. There have been several appeals. You will read about them in the newspaper: Saudi Arabia, OPEC, won't you please produce some more oil? What OPEC says is, we think we are producing enough oil. I think that the correct answer really is, we can't produce oil any faster than we are producing it. I think that they have probably reached their maximum production of oil. The little blue line here shows what has happened to price, and notice in the last year or so what has happen to price, up, up, up.

The first time I came to the floor here, as I said, was a bit more than 3 years ago and oil was, what, 50 and a couple of dollars a barrel. Now today it was \$112 a barrel.

The production of oil has remained constant. The demand for oil has gone up. That is really a simple relationship. When the demand for a product is greater than the supply of the product, people bid it up. It is like at an auction. If two or three people want something, and there is only one of the thing they want, they bid it up to ridiculously high levels. And that is what is happening with oil. To get it, you have to outbid the other guy. And so now it is \$112 a barrel.

The next chart is a schematic chart. And it shows the same curve we have been looking at. And by the way, it is obvious that we can make this curve really sharp by simply expanding the ordinate and compressing the abscissa. Here it is spread out. But in any

event, this follows a roughly 2 percent increase in use. That doesn't sound like much, does it? As a matter of fact, our stock market gets really jittery when our growth is only 2 percent. It is going to have to get over that, Madam Speaker, because we can't continue 2 percent growth forever. With 2 percent growth, it doubles in 35 years. It is four times bigger in 70 years. It is 8 times bigger in 105 years. And it is 16 times bigger in 140 years.

Now, when your only perspective is the next quarterly report or getting yourself through the next election, this 2 percent growth, which in 140 years from now will be 16 times bigger, makes whatever is growing at 2 percent, 16 times bigger may not seem very important to you. But I have ten kids and 16 grandkids and two great grandkids. And I would sure like them to live in a world as comfortable as the world I live in and to have the opportunities that I've had.

This yellow here represents a growing gap. If, in fact, we are at this point, and the charts that we have just seen would indicate that we probably are, then the increasing demand is going to result in a deficit which will be reflected in higher oil prices and higher gas prices at the pump. The big focus that most people are talking about is, gee, how are we going to fill that gap? Let me suggest, Madam Speaker, that we are not going to fill that gap. There are no readily available substitutes for oil out there. A little bit of this and a little of that, if you sum them all up, they are still far short of the amount of oil we are now using.

Now we are going to continue to have oil. We are not running out of oil. What we are doing is running out of our ability to produce oil as fast as we would like to use it. There will be oil, gas and coal around for another 150 years, ever less and less, harder and harder to get, at higher and higher costs.

The next chart is really a quote from what I think will shortly be recognized perhaps as the most insightful speech given in the last century, given 51 years ago, the 14th day of this May. Hyman Rickover, the father of our nuclear submarine, gave this speech to a group of physicians in Saint Paul, Minnesota. You can find that.

There is a link in our Website to it, or you can simply do a Google search for ``Rickover energy speech," and it will pop up. It was a really insightful speech.

In the 8,000 years from the beginning of history to the year 2000 AD, world population will have grown from 10 million to 4 billion. He kind of missed that. World population is about 7 billion people now. With 90 percent of that growth taking place during the last 5 percent of that period, with way more than 90 percent of that growth taking place in the last 5 percent of that period. It took the first 3,000 years of recorded history to account the first doubling of population, 100 years from the last doubling, but the next doubling will require only 50 years. As a matter of fact, it required considerably less than 50 years.

The next chart is not a chart of population growth, but it could just as well have been. This is a chart showing the increase in energy availability, our consumption of energy.

And if I superimpose on this a chart of population growth, it would follow this almost exactly. Our world population has grown from half a billion or so to 7 billion people, and most of it, as Hyman Rickover pointed, in the last little while. And look, I don't go back 8,000 years. I only go back 400 years, but if I went back the rest of the 8,000 years, it would still be pretty much down near zero.

The Industrial Revolution began with wood. And then we found coal. And boy, did it take off when we found gas and oil. Now here we see that discontinuity in the 1970s, what we have done here, of course, is to expand the ordinate and compress the abscissa so that we have a very sharp curve. That is the same curve we have seen several times before. But it looks different depending on the scale you have in the ordinate and in the abscissa.

The next chart is some data in Hyman Rickover's speech. And it is even more so today. With high energy consumption goes a high standard of living, he said. Thus, the enormous fossil fuel which we in this country control feeds machines which make each of us a master of an army of mechanical slaves. This was 51 years ago. What he said then is true even more so today. He said that we represent, I have seen data a little more than this, roughly 35 watts of energy, sleeping and waking. Standing here and talking here, I am more like a 70-watt bulb. That is not very much, is it? As a matter of fact, if you look at the amount of food which you eat in a day, if you dried it, if you burned it and made a fire of it, it would hardly warm your fingers on a cold day. Just look at the C Rations that our military uses and how compact they are. You put water in them and they swell up. They look like a lot. But the actual dry material there is not much. In fact, he said 51 years ago, the household appliances that make life so comfortable for the family represented the work output of 33 men. He said that the machines which make our cars and refrigerators and so forth represent 244 men. Two thousand men push your automobile down the road. The energy it takes to move your car down the road is the energy of 2,000 men working. One hundred thousand men push the locomotive down the road. And 700,000 men push the jet plane through the sky.

When I first saw the data that said that one barrel of oil represented 25,000 man hours of effort, the work output of 12 people working all year, I said to myself, gee, that can't be. But then I thought, I have a Prius car. I bought the first one in Congress and the first one in Maryland. And a gallon of gasoline is still cheaper than water in the grocery store, by the way, if you buy it in the little bottles. I thought about how far that gallon of gasoline takes my car and how long it would take me to pull it those 47 miles that the gallon of gasoline takes my car. I said, gee, it is probably true that one barrel of oil represents the work output of 12 people working all year. Now we are the beneficiaries of an incredible quality of life

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which is the result, the direct result of our access to all of this energy.

The next chart is another quote from Hyman Rickover, whether this Golden Age, and it is a golden age. Nobles of old lived nowhere near as well as we live today. The poorest in our country, maybe it's not quite true in other countries, live better than nobles of

yesteryear because of the incredible access that we have to this energy. Whether this Golden Age will continue depends entirely upon our ability to keep energy supplies in balance with the needs of our growing population. Now we haven't done that or we wouldn't have headlines like this today: ``Global food riots turn deadly."

In a few moments, I will discuss the relationship between those global food riots and this other headline: ``Gas hits a record."

Possession of surplus energy is, of course, a requisite for any kind of civilization. For if man possesses merely the energy of his own muscles, he must expend all his strength, mental and physical, to obtain the bare necessities of life.

This article on food notes that in much of the third world, 50 to 60 percent of the income of the family goes to food. Do you know what that is in our country? It is less than 10 percent. Food doubling in price in our country doesn't mean much. But if you're paying 50 percent of your income to buy food, and it doubles in price, then it takes 100 percent of your income to buy that food. So it really, really is important to the poor of the world.

A reduction of per capita energy consumption has always, in the past, led to a decline in civilization and a reversion to a more primitive way of life.

The next is another quote in from Hyman Rickover. By the way, Madam Speaker, I am going through these quotes, and then I am going to use quotes from four studies that our government has paid for with our taxpayers' money and then ignored. And what I am going to be asking is, with this history, with this great speech given by Hyman Rickover 51 years ago, and with the warnings in these four studies released over the last several years, why aren't you hearing more about a meaningful program to address this energy challenge that we face?

There is nothing man can do to rebuild exhausted fossil fuel reserve. They were created by solar energy a long time ago, he says 500 million years ago, it took eons to grow to their present volume. In the face of the basic fact that fossil fuel reserves are finite, that's a great statement. Just reflect on this.

The exact length of time that these reserves will last is important in only one respect.

Now he didn't know how long they were going to last because he didn't know how long this Golden Age will last. But we now know pretty much. It will be, Madam Speaker, about 300 years long. We are about 150 years into it. We are now at the pinnacle of the Golden Age. Will it be in another 150 years as these fossil fuels become less and less available at higher and higher costs?

The exact length of time that these reserves will last is important in only one respect. The longer they last, the more time that we have to invent ways of living off renewable or

substitute energy sources and to adjust our economy to the vast changes which we can expect from such a shift. Fifty-one years ago. Really prophetic.

Madam Speaker, with this kind of insightful advice 51 years ago, with headlines like this in the paper, with these four reports paid for by our government, why haven't we done something? Why aren't we doing something?

[Time: 18:00]

“Fossil fuels resemble capital in the bank.”

I love this statement. “A prudent and responsible parent will use his capital sparingly in order to pass on to his children as much as possible of his inheritance. A selfish and irresponsible parent will squander it in riotous living, and care not one whit how his offspring will fare.”

With the shortages in oil, which have driven up the price of gasoline, they want me to vote to drill in ANWR and offshore. I have got 10 kids, 16 grandkids and two great-grandkids, and I ask them, if you can drill in ANWR tomorrow, what would you do the day after tomorrow? And there will be a day after tomorrow.

We are leaving our kids a horrendous debt, growing by leaps and bounds. Not with my vote, if you will check the record, but we are leaving them that debt. And I ask those who would like me to vote to drill in ANWR and offshore, wouldn't it be nice if I left my kids and my grand-kids and my great grandkids a little energy to deal with this horrendous debt?

The next is a quote also from Hyman Rickover. You can see why I believe this will be shortly recognized as perhaps the most insightful speech given in the last century. “I suggest this is a good time to think soberly about our responsibility to our descendants.” Wow, 51 years ago, and there are very few who are thinking soberly at all about this today.

“I suggest this is a good time to think soberly about our responsibilities to our descendants, those who will ring out the fossil fuel age. We must give a break to these youngsters by cutting fuel and metal consumption.”

Wow. 51 years ago. And what we have done since then, with no more responsibility than the kids who found the cookie jar or the hog who found the feed room door open, we just have been pigging out on energy, as if it were forever, as if there was an endless supply. It is obviously finite. The moon isn't made out of green cheese and the Earth isn't made out of oil. I see chairs and trees and grass and sticks and stones out there. Obviously it isn't all oil, and it is not going to last forever.

``So as to provide a safer margin for the necessary adjustments which eventually will be made in a world without fossil fuel."

A year ago, Christmas-New Year's break, I led a codel of nine to China to talk about energy. They began their discussion of energy by talking about post-oil. In an environment where it is hard for us to see beyond the next quarterly report or the next election, they are looking generations and centuries down the road. There will be a post-oil world. It is not going to be totally post-oil for about another 150 years, but increasingly there is going to be less and less, higher and higher costs, more and more difficult to get.

The next chart is just kind of a repeat of the wise advice he has been giving. ``High energy consumption has always been a prerequisite of political power. Ultimately the nation which controls the largest energy resources will become dominant."

I am going to show a chart a little later that shows that China is buying up energy oil all over the world. They kind of understand that. ``If we act wisely and in time to conserve what we have and prepare well for necessary future changes, we shall ensure this dominant position for our own country."

I will show a chart in a few moments that shows we have 2 percent of the oil, we use 25 percent of the world's oil, and import almost two-thirds of what we use. We don't even come close to following the wise advice that he gave 51 years ago.

Now, four studies, and here they are. The Hirsch Report, February 2005. This is a big study done by SAIC, Science Applications International Corporation, a big prestigious international corporation, paid for by our Department of Energy.

Here is a second report paid for by the U.S. Army Corps of Engineers, paid for by the Army, done by the Corps: ``Energy Trends and Their Implications for U.S. Army Installations." It could have been U.S. or world, because our army is a microcosm of the U.S. and world.

A second Hirsch Report, ``Peaking of World Oil Production, Recent Forecasts."

Then the third of these reports, which your government has asked for and paid for, as a matter of fact, this one I asked for as a senior member of the Science Committee, this is done by GAO. ``Crude Oil. Uncertainty About Future Oil Supply Makes It Important To Develop a Strategy for Addressing a Peak and Decline in Oil Production." Where have you heard anybody talking about this strategy? Where have you read about this strategy in the newspaper? This is a GAO report, February 2007.

The last of the studies. ``Hard Truths. Facing the Hard Truths About Energy. Comprehensive View to 2030 of Global Oil and Natural Gas," done by the National Petroleum Council.

I have quotes from all but the last of these. This is the newest one, and I will get some quotes to include. They are saying essentially the same thing as these others.

The next chart and the first few charts will be quotes from the Hirsch Report. I am going to spend a lot of time this evening going over the information that has been available to all of us, to our leaders, and I am going to keep asking the questions, how come it has been ignored?

The Hirsch Report: "World oil peaking is going to happen. World production of conventional oil will reach a maximum and decline thereafter. That maximum is called the peak. A number of competent forecasters project peaking within a decade." This was several years ago. Others contend it will occur later.

Prediction of the peaking is extremely difficult. In fact, you only know it has peaked after you look back and say gee, it was the highest back then. No matter what we do, we can't get more. So you will know it has peaked only in retrospect when you look back to see that it has peaked.

Oil peaking presents a unique challenge. The world has never faced a problem like this. There is no precedent in history to guide you. There is nothing that has happened in the past which will help you through this. The world has never faced a problem like this. "Without massive mitigation," more than a decade before the fact, the chart you saw a little earlier, remember, EIA, IEA, 3 years, flat plateau, looks like we peaked now. He says "Without massive mitigation," more than a decade before the fact, "the problem will be pervasive and will not be temporary. Previous energy transitions, wood-to-coal and coal-to-oil were gradual, and evolutionary oil peaking will be abrupt and revolutionary."

The next chart, additional quotes from this report. "The peaking of world oil production presents the U.S. and the world with an unprecedented risk-management problem. The world has never faced a problem like this. As peaking is approached, liquid fuel prices and price volatility will increase dramatically, \$112 a barrel, "and, without timely mitigation, the economic, social and political costs will be unprecedented. Food riots. People killed."

Well, we will talk in just a few moments about the relationship between oil and food so that you will see why the crisis in energy is reflected in this crisis in food availability.

The next chart is another one from the Hirsch Report. "We cannot conceive of any affordable government-sponsored crash program to accelerate normal replacement schedules." This is going to be a new world. We are going to have to think differently. We are going to have to use energy differently.

As far as fossil fuels are concerned, I think the Hirsch Report is exactly right. I am more sanguine about electricity. More nuclear, wind, solar, with appropriate storage for

those two because they are intermittent, more hydro, true geothermal. We can in some parts of our country tap the molten core of the Earth, as they do for all of their energy in Iceland. I think we can make reasonably as much electricity as we ought to be using. I am not at all sure that is true about liquid fuels. The substitutes for oil are just few and difficult, as we will see.

The next chart is an interesting one from the Hirsch Study. Most of the world's experts believe that we have found about 2 trillion barrels of recoverable oil. There is a lot more out there, but it is locked in tiny little droplets in between grains of sand and shale and so forth, and with present technology we are likely not going to get it. And the cost of ever getting it may exceed its value when you get it, so it is maybe not practically recoverable.

Well, there are some people who believe that we are going to find as much more oil as all the reserves that we now know exist. And this is an interesting chart, because instead of talking about roughly 2 trillion barrels, they are talking about 3 trillion barrels of oil. Even if that is true, this is the same curve we saw before, remember, the stutter in the seventies with the worldwide recession, slower growth now, peaking now if we don't find any more. They say if we find as much more oil as all the oil we now know exists which is recoverable, it will extend the peak only to 2016. Wow. That is the power of compound growth.

After the discovery of nuclear energy, Albert Einstein was asked, "Dr. Einstein, what will be the next big energy force in the world?" He said, "The most powerful force in the world is the power of compound interest, compound growth." Poorly understood. But that is what we are seeing here.

So if we found, which we are not going to, a little, vanishing small possibility that we are going to do that, but if we found as much more oil as all the oil which now is known to be recoverable, it would push the peak out only to 2016. And this curve shows what would happen if you use heroic techniques and enhanced oil recovery and get it out of the ground quicker. Then you fall off a cliff. You can't pump what you have not found.

The next chart is an interesting chart that shows the projections of our EIA, the Energy Information Administration. I don't have time to go into the strange use of statistics here, but somehow they went from a frequency mode to a probability mode, and they somehow have reached a conclusion that a 50 percent probability is more probable than a 95 percent probability.

So they were projecting that this green is where we were going with the discovery of oil. This is the 95 percent probability. This is the 5 percent probability. And, as one would expect, 95 percent is more probable than 50 percent. So the actual discoveries in red here have been following the 95 percent probability. So I would be very suspicious of projections using USGS data, which is where this comes from, of future oil production.

The next chart addresses this, and this is Jean Laherrere, one of the world's giants in this area. It says, "The USGS estimate implies a five-fold increase in discovery and

reserve addition, for which no evidence is presented. Such an improvement in performance is in fact utterly implausible, given the great technological achievements of the industry over the past 20 years, the worldwide search, and the deliberate efforts to find the largest remaining prospects."

I think he is right. I think there is little probability that we are going to find huge amounts of additional oil. As a matter of fact, most of the world's experts believe we have probably found about 95 percent of all that we will ever find.

The next chart, and now we have a series of charts we will go through quickly from the Corps of Engineers study, this was the second one done. "Oil is the most important form of energy in the world today. Historically, no other energy source equals oil's intrinsic qualities of extractability, transportability, versatility and cost."

It is incredible, the energy density of oil and all the things that you can do with it. We live in a plastic world, a huge petrochemical industry. All of that starts with gas and oil, and some coal. Because once you have this long hydrocarbon chain, whether it is gas or coal or oil, the chemist can do with it about what he wishes.

[Time: 18:15]

The qualities that enabled oil to take over from coal as the front line energy source for the industrialized world in the middle of the 20th century are as relevant today as they were then.

The next chart is a really interesting one. This is a study done by very knowledgeable people. The current price of oil is in the \$45 to \$57 per barrel range and it's expected to stay in that range for several years. It is \$112 a barrel today.

They all missed it, friends. M. King Hubbert was right. The United States peaked in 1970. I use 28 years that we have blown. That's because by 1980, 28 years ago, we absolutely knew, looking back that M. King Hubbert was right about 1970. We did peak in 1970.

In 1979 he made the prediction the world would be peaking and, let me ask you, if M. King Hubbert was right about the United States and if, in spite of drilling more oil wells than all the rest of the world put together, why should we not be concerned about his prediction that the world would be peaking in oil about now?

Don't you think that someone might have said, gee, M. King Hubbert was right about the United States? Isn't the United States a microcosm in the

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world? Mightn't he be right about the world and shouldn't we be doing something about that?

Oil prices may go significantly higher. They have, indeed, and some have predicted prices ranging up to \$180 a barrel in a few years. Goldman Sachs says that oil may very well be \$150 to \$200 a barrel by the end of this year.

The next chart, another one from the Corps of Engineers, petroleum expert Colin Campbell, Jean Laherrere, Bryan Fleay, Roger Blanchard, Richard Duncan, Walter Younquist and Albert Bartlett, no relative of mine, I wish I had some of his genes. He has given his speech on energy, I think, over 1,600 times.

Do a Google search for Albert Bartlett and energy. It will be the most 1-hour lecture you have ever listened to. Using various methodologies, all estimated that a peak in conventional oil production will occur in 2005. It's 2008, I think it probably has occurred.

The corporate executive officers of these several companies also published estimates of a peak in 2005. The next chart from the GAO, and now I move to the third of the GAO studies, this shows this large number of experts, of sources, and when they thought peak would occur. Now, some of them are pretty indecisive.

It could be now, it could be a long, long time from now. But notice that a great many of them thought they would be occurring about now. There is a general consensus, and this was published 2, 3 years ago, general consensus, that peaking would be occurring about now.

Another chart from GAO, and this kind of puts things in perspective, the little bar on the right shows the top 10 oil and gas companies on the basis of oil reserves. Who has the oil, and 98 percent of that is resident in countries where the oil is owned by the country. Luke Oil, which is kind of not owned by the government, represents only 2 percent.

The left, and this is the top 10 oil and gas companies on the basis of production. This is how much they have, this is how much they produced. The giants that you read about every day making \$40 billion a year profits, and, by the way, it's not their fault. It's not because they are gouging you. It's not because they are schemers. It's simply they are simply happy recipients of a windfall that results when you want to use more oil than there is, and that drives the prices up.

I wouldn't be critical of the profits. I would really be critical if they didn't use the profits properly.

Our giants, ExxonMobil, Royal Dutch, BP, produce only 22 percent of the world's oil and 78 percent of the world's oil is produced by these country-owned companies.

The next chart shows essentially the same thing in another form. Here we see the OPEC oils, Saudi Arabia and OPEC and the remainder.

The next chart, now, I like this one because if a picture is worth 1,000 words, this is worth a few thousand words. This shows you the same thing as those last couple of charts.

But, boy, is this dramatic. This shows you what the world would look like if the size of the country was relative to how much oil it had. Look at Saudi Arabia. It dominates the landscape and, indeed, in the oil world, it dominates the landscape. It has 22 percent of all the known reserves of oil in the world.

Little Kuwait, Saddam Hussein thought it looked like a little corner province in Iraq. Iran, first, second, third, fourth, northern Africa, our neighbor to the south, Venezuela, Hugo Chavez, dwarfs us, what, three, four, five times as much oil?

Here we are, the United States, using a fourth of all the oil in the world, and we have 2 percent of the known reserves of oil in the world. The two countries from which we get our most oil, that changed a couple of days ago. By the way, it used to be Canada and then Mexico. I think it's Canada, Saudi Arabia and then Mexico now. That has because the second largest oil field in the world, the Cantarell oil field in Mexico, is in rapid decline, so they cannot produce at the rates they produced before.

Kind of keep this map in your mind. Look at China and India over there. Here they are. Look at Russia, huge compared to China and India. China and India together have no more oil than we, and they have, what, a third of the world's population, rapidly-growing demand for oil. In some parts of Beijing, bicycles are now banned. There isn't room for them on the roads because there are so many automobiles there.

The next chart simply shows some numbers that I have been using. Two percent of the world's reserves consume 25 percent of the world's oil, import almost two-thirds of what we use. Less than 5 percent of the world's population, one person in 22, produce 8 percent of the world's oil from only 2 percent.

What that means is we are pumping our wells four times faster than the average, right. So we now have only 2 percent of the reserves. We are pumping on down really fast, we are really good at that. We have more oil wells that I mentioned than all the rest of the world put together.

The next chart is a really interesting one. This shows what China has been doing. They are going around the world. You see the big symbols there for China going around the world and buying oil. They almost bought Unocal in our country. They are buying oil everywhere. In today's economy that doesn't make much sense because whoever has the dollars gets the oil. So why are they buying oil?

At the same time they are buying oil, they are also aggressively building the largest blue-water Navy in the world. Might the time come that the Chinese tell us, gee, I am sorry, the oil is ours? We have 1.3 billion people. They have got to have oil. I'm sorry, we

can't share it. If they are going to make that a reality, they have to have a Navy big enough to control the world's shipping lanes.

Talking about geopolitical consequences, a statement by our Secretary of State, Condoleezza Rice, ``We do have to do something about the energy problem." Boy, this was 2006, 2 years ago. What have we done about the energy problem in the last 2 years? We do have to do something about the energy problem.

I can tell that you nothing has really taken me aback more than the Secretary of State about the way of the politics of energy. I will use the word ``warping" diplomacy around the world. We have simply got to do something about the warping now of diplomatic effort for the all-out rush for energy supply.

She recognized that 2 years ago this month. What have you seen your country doing about that in the last 2 years? Why this gross denial? I think the evidence is clear to a third grader.

The next chart, a very recent one, January 22 of this year, ``By the year 2100, the world's energy system will be radically different from today. The world's current predicament limits our maneuvering room. We are experiencing a step change in the rate of growth energy demand."

Shell estimates that after 2015 easy-to-supply that easy access to oil and gas will no longer be able to keep up with demand. It may be sooner than that, but that is not very far away. As a result, society has no choice but to add other sources of energy.

We have only a few minutes remaining. Let's put the next the chart up. This chart addresses some of those other sources of energy.

I will tell you that we are very much like the young people whose grandparents have died and left them a big inheritance. They now have established a lavish lifestyle where 85 percent of all the money they spend comes from their grandparents' inheritance, and only 15 percent of that money are they earning. And they look at how old they are, and the size of the inheritance, and it's going to run out long before they retire.

Obviously, they have got to do something. They either have to earn more or spend less. That's precisely where we are with energy. Eighty-five percent of the energy that we are using, coal, petroleum and natural gas, comes from fossil fuels, the grandparents' inheritance. It's finite, it will run out.

Only 15 percent of that is from other sources, generally referred to as renewable sources. A bit more than half of that comes from nuclear. We produce 8 percent of our total energy from nuclear, that's 20 percent of our electricity.

We have the largest nuclear electricity production in the world, but not

the biggest percentage. France produces about 75, 80 percent of their electricity from nuclear.

Then the 7 percent, now this is 2000, things have changed a little since then. Solar, 1 percent; wind, 1 percent, that's the .07 percent, so it has increased four-fold, 2.8 percent, big deal, .28 percent, 1/4 of 1 percent? I am a big fan of nuclear.

I have an off-grid home, and I use solar panels, I use wind machines. I am a big fan of wind and solar. But they are now tiny contributors to our total energy supply.

Wood, that's not the mountain family, that's the paper industry and the timber industry wisely using a waste product. Waste, that looks huge, and it's not a bad idea to turn your waste into electricity. You can do that. We have a great plant up here in northern Montgomery County.

But that waste stream is not a solution to our problem, because what that waste stream represents, just go to the county dump and look at it. What that waste stream represents is a profligate use of fossil fuels. In a fossil fuel deficient world it's not going to be there. It's an expedient for the moment. It doesn't even come close to offering a rational solution to our problem.

Conventional hydro, we probably peaked out in conventional hydro. We can do a lot of microhydro. There are some really good microturbines now.

Alcohol, let me come back now, I only have a couple of minutes remaining. I want to make the tie between our food problems and the gas prices.

We have a program of converting corn to ethanol. The National Academy of Sciences have said that if we used all of our corn for ethanol, all of it, and discounted for fossil fuel input, it would displace 2.4 percent of our gasoline. They said that if you tuned up your car and put air in the tires, you would save as much.

Now, corn doubled in price because we were doing that. Farmers diverted land from soybeans and wheat to corn. So now we have doubled the price of corn, roughly doubled the price of soybeans. Since these commodities moved together, the price of rice has doubled.

Now we have global food riots turned deadly. What one U.N. official said was what we did innocently, we just hadn't thought it through, that what we did was a crime against humanity.

Our trifling contribution to displacing oil has doubled the price of corn, nearly doubled the price of soybeans and rice. There are people who spend 50 to 60 percent of their income on food. If the food price doubles, they are spending 100 percent of their income on food. No wonder they are rioting.

Well, this was an unintended consequence. The last chart, we have only a couple of minutes remaining, and I just want to say that I find this challenge really exhilarating. There is no exhilaration like the exhilaration of meeting and overcoming a big challenge.

We are the most creative innovative society in the world. We are up to this with proper leadership. I am looking for that leadership. We are up to this.

We need a program that has a total commitment of World War II. I lived through that war. I know what it was. Everybody raised a victory garden. No cars were made in 1943, 1944 and 1945. We needed the technology focus of putting a man on the moon, and we needed the urgency of the Manhattan project.

[Time: 18:30]

We can lead the world in moving from fossil fuel dependency to renewables. We are creative and innovative. We need leadership to do this.

I want to show you that we can do it. We can live very happily on less. On this chart, here we are, using more energy than anybody else in the world. And there are 24 countries using considerably less energy than we who feel better. This is how good you feel about your station in life, they feel better about their station in life than we.

The very last chart, in the very few seconds remaining, this shows you that Californians use only about 65 percent as much electricity as the rest of us in the United States. Challenge any Californian to admit that they live less well than we live.

We don't have to use the amounts of energy that we are using today to be comfortable, to feel good about life.

I really feel challenged by this. We are the most creative, innovative society in the world. We can do this. We can once again become a manufacturing country. We can lead the world in this.

Madam Speaker, I am 82 years old on my next birthday; and there is nothing in my life, and I have seen more of life than every other Member of this Congress except *Ralph Hall* who is 3 years older than I, and I have seen nothing in my life that is so challenging, so exhilarating as this.

We are up to this. We need the leadership; where is it?

END