Mr. MURPHY of Connecticut. Thank you, Mr. RYAN, and let me just add my thanks not only for allowing us to come down and join you this evening, but for everything you have done over the past 4 years, in particular over the past 2 years, to help us get here and be part of this healing process, which I think this week and a half has been.

You will hear some acrimony from the other side, but when you look at the votes, as Mr. MEEK ran through, in the end, there is a lot of healing that happens here because we are working on things that benefit both sides.

I tell you, all of us new Members, and there are 50-some odd new Members, we all may have certain different issues that were accentuated to a greater or lesser degree in our races, but we have found in talking to each other these first few days that what binds us is the sense our constituents sent us here to get this place working again, get it working again for the right people.

I know from our side of the aisle we will do that with whoever it is. If you are liberal, conservative, Democrat, or Republican, we want to make this a place where we work together again. That is maybe why that sense of euphoria in my district that I talked about in the beginning is maybe due in part to the issues, to the substance that has happened here; but in part it is due to the sense they have that this place is back at work in a way that it hasn't been.

So I am just so grateful for what Mr. RYAN and Mr. MEEK have been able to do for everyone, us and all of our constituents, over the past 4 years, and grateful to have a few moments.

I yield to my friend from New York.

Ms. CLARKE. Thank you very much to the gentleman from Connecticut for sharing that, because I can only say ''ditto.''

We are, I believe, doing what needs to be done for the future of the Nation. While we see the immediate impact because we were campaigning and there were certain issues that had come before us, when I look at the fact that 8th graders, who will be entering college in 5 years, will be paying half the interest rate that current college students are paying, we are making a substantive difference in people's lives. That could encourage that one student who was saying there is no way my family can afford it to say, you know what, I can make it. And that is what this is about, future generations.

I want to thank the leadership, Mr. MEEK, Mr. RYAN, for giving us this forum in which we can reach out to the American people to come together in common cause with our colleagues, and even some of those folks on the other side of the aisle, to really do the work that is needed to be done for future generations. We have been doing it in the first 100 hours, and I look forward to doing it even more so as we move forward in the 110th session.

I yield to you, Mr. RYAN.

Mr. RYAN of Ohio. I thank the gentlewoman.

Again, raising the minimum wage, cutting student loan interest rates in half, and repealing the corporate subsidies to the oil companies so we can pay for some of this stuff. We are doing some great stuff for the American people, and I want to thank Leader Pelosi.

I will kick it to my friend from Pennsylvania to give us the Web site.

□ 2045

Mr. ALTMIRE. I wanted to, Mr. Speaker, remind my colleagues that are here with us tonight if they wanted to share with their constituents, our website for this working group, it is www.speaker.gov/30something. Or they could send an e-mail directly or have their constituents send an e-mail directly to 30somethingdems@mail.house.gov. And at this point I would like to yield back to my friend, the gentleman from Florida.

Mr. MEEK of Florida. Well, I can tell the gentleman from Pennsylvania, you just had a great honor, because that is usually, for the last 4 years, that has been Mr. RYAN's honor, and he has now passed that on to you, so that means when you are here on the floor, the 30-something Working Group, it is your responsibility to give the website out and the e-mail address out. So consider yourself a friend, I guess, because since you all share the same media market, he thought he would be nice to you.

Let me just say in closing, it is an honor being joined here by my colleagues here in the House. And I can tell you, Mr. Speaker, even when I first came here to this House of Representatives, the good thing about being a Member of this House, when we take our voting card out, that is one vote. We all equal the same one vote. And that is very significant here in this Chamber.

We are going to take some tough votes, Mr. Speaker, and we are going to need Members to step up to the bat and be Members and be leaders on behalf of their district and on behalf of America.

And with that, we would like to thank the Speaker for the time to be here on the floor. Also, our Democratic majority leader and our Democratic whip and chairman and vice chairman for everything that they have done.

And with that, Mr. Speaker, we would like to yield back the balance of our time. And it was an honor addressing the House.

PEAK OIL PRODUCTION

The SPEAKER pro tempore (Mr. HALL of New York). The gentleman from Maryland (Mr. BARTLETT) is recognized for 60 minutes.

Mr. BARTLETT of Maryland. Mr. Speaker, tomorrow we vote here in the House on an energy bill. And I thought it might be appropriate to spend a bit of time this evening looking at where we and the world are relative to energy. I have here a chart with some numbers on it that inspired 30 of our prominent Americans, Jim Woolsey, Boyden Gray, McFarland and 27 others, among them retired four star admirals and generals, to write to the President a letter which said, ''Mr. President, we have only 2 percent of the world's oil reserves. We consume 25 percent of the world's oil, almost two-thirds of which we import. And that presents a totally unacceptable national security risk. We really have to do something about that to free ourselves from the necessity of buying foreign oil.''

The President recognizes that this is a problem. In his recent State of the Union message he said that we are hooked on oil.

There are a couple of other interesting numbers here. We represent actually a bit less than 5 percent of the world's population. We represent about one person in 22 in the world. And with only 2 percent of the world's oil reserves, we are pumping 8 percent of the world's oil. What that means, of course, is that we are pumping our oil four times faster than the rest of the world. We have been pumping less oil each year now for several years, and with this high pumping rate that decline will accelerate.

How did we get here? To find how we got here, you have really got to go back about 6 decades. I didn't know last year on the 14th day of March, when I gave the first speech here on the floor about peak oil, that I was just 6 days beyond the 50th anniversary of what I think will come to be seen as the most important speech given in the last century. This was a speech given by M. King Hubbert, a Shell Oil company geologist, to a group of oil people in San Antonio, Texas. At that time, if you look back in your history books, you will see that we were the largest producer of oil in the world. We were the largest consumer of oil in the world, and we were the largest exporter of oil in the world.

And M. King Hubbert shocked his audience by telling them that in just about a decade and a half, roughly 1970, the United States would peak in oil production. And no matter what we did after that, our production of oil would decline.

I have here a curve which shows his prediction. His prediction is the small green symbols here, and the actual data points are the larger green symbols. And you see they reasonably followed his predicted curve. By 1980, when Ronald Reagan took office, we were already well down the other side of Hubbert's peak, and we knew very well that M. King Hubbert had been right about the United States.

Now, in 1969, M. King Hubbert predicted that the world would follow the United States in peaking in oil production about now. If he was right about the United States, why shouldn't he be right about the world?

It has now been 27 years since we knew, in 1980. We are already 10 years down the other side of what is called Hubbert's peak. And we knew that he

was right about the United States and he had predicted that the world would be peaking about now.

If he was right about the United States, why shouldn't he be right about the world? And shouldn't we have been doing something about anticipating this world peaking oil production?

The red symbols there, by the way, are a similar curve for the former Soviet Union, now today, Russia. And you see that when they fell apart they did not meet their expectation, so they are now having a second little peak, but they will follow the general downward trend.

How was M. King Hubbert able to predict this? We had already been producing oil for quite a while in 1956, and M. King Hubbert had watched the exploitation and exhaustion of some individual oil fields, and he found that they always followed what we call a bell curve. Small production at first, and then increasing and finally reaching a maximum, and then falling off the other side.

This bell curve is very familiar. If you weigh people, some will be very light and some will be very heavy, but most of them are somewhere in the middle and they follow a bell curve. If you measure the heights of people, they will follow a similar curve, or the number of mice in a mouse's litter. There are just a great many things that follow this kind of a curve.

So he noted two things, one, that most of the fields tended to be exploited and exhausted in a bell curve, and when they had reached a maximum, for the average field, half of the oil had been pumped. And so he rationalized that if he knew how many fields the United States had, and how many more we would discover, if he added up all the little bell curves he would have one big bell curve which would indicate when the United States would peak in oil production.

He did that. His math may be difficult to follow, but his reasoning is pretty simple. He did that, and he predicted it would be 1970. And right on schedule, we peaked in 1970.

I have been joined on the floor by my good friend, also from Maryland, WAYNE GILCHREST. And before I yield to him, I would just like to introduce what he is going to talk about by quoting here from the International Energy Agency. This is a recent press release. And what they say here, ''The energy future we are facing today, based on projections of current trends, is dirty, insecure and expensive. But it also shows how new government policies can create an alternative energy future which is clean, clever and competitive.''

They go on to say that ''energy demand increases by 53 percent between now and 2030.'' Well, it may. The demand may increase by 53 percent, but the use will not increase by 53 percent because, as you will see when we develop the subject this evening, the oil almost certainly will not be there to meet this demand.

Over 70 percent of this increase comes from developing countries led by China and India. World oil demand reaches 116 million barrels per day in 2030, up from 84 million barrels today in 2005 and 2006 and 2007. That number really hasn't changed. We have been on a plateau for the last 3 years of about 84, 85 million barrels of oil per day.

By the way, we use about 21 million barrels a day, about exactly one-fourth of that. Most of the increase in oil supply is met by a small number of major OPEC producers. Non-OPEC conventional crude oil output peaks, they say, by the middle of the next decade. Most observers believe that that has now peaked and, as a matter of fact, the world is about to peak. These trends would accentuate consuming nations' vulnerabilities to a severe supply disruption and resulting price shocks. They would also amplify the magnitude of global climate change.

Mr. GILCHREST, I am pleased to yield to you. They introduce the subject that I know you are very much concerned about, and that is what our increased use of fossil fuels is doing to our climate and how it is affecting global climate change and global warming.

Mr. GILCHREST. I have sort of a summary, I guess you could say, a Global Warming 101 Introductory, which will take about 10 minutes, so I am not sure how you want to proceed. Do you want me to just give this sort of a 10-minute introduction to global warming, or break it up with your dialogue?

Mr. BARTLETT of Maryland. I think that would be very instructive for our audience. Please do.

Mr. GILCHREST. Congressman BARTLETT is talking about peak oil, the idea that our energy from oil is a finite resource, it is limited. And what I would like to do, in conjunction with that, is to give a perspective on one of the legacies of the age of oil, and that is global warming, heating the planet, upsetting that delicate balance between what the Earth has been used to for thousands of years, and the natural range of fluctuation in the climate, to what we have done in less than 100 years as a result of burning fossil fuel, oil in particular.

So here is how I would like to proceed. Number one, the Earth has a livable climate. The biosphere, which is the area of the planet that contains life forms that we have become familiar with is possible because of something called the greenhouse effect.

Now, in our atmosphere, we have oxygen, water vapor, methane, carbon dioxide, a number of different chemical mixes which provide us with the air we breathe and the type of atmosphere that produces, in part, the climate that we have, hence the greenhouse effect. It is warm enough and cool enough for life, as we know it, to exist.

Now, one of the most important greenhouse gases, other than water vapor, other than oxygen, other than methane—all of these contribute to the greenhouse effect—is carbon dioxide, or CO_2.

Now, even though carbon dioxide is less than 1 percent of the makeup of our atmosphere, it is critical in the heat balance of our planet. Now, that sort of gives us an idea of the importance of these greenhouse gases and the importance of carbon dioxide.

Now, is the Earth warming? There is no question, everybody would say yes, the Earth is warming, and it has been warming for the last 10,000 years. It has been warming for the last 10,000 years because that was the end of the Ice Age 10,000 years ago, and sea level has been rising, and the planet has been warming all of that time.

□ 2100

It is warming, in part, because there is an increase in carbon dioxide in the atmosphere. Ten thousand years ago, and you can evaluate this by looking at ice cores and checking the bubbles out, and see what the content in our atmosphere of CO_2 was by looking at those bubbles in ice cores from Greenland or the Antarctic, and CO_2 was about 180 parts per million in the atmosphere 10,000 years ago. CO_2, a greenhouse effect, or a greenhouse gas, was at 180 parts per million 10,000 years ago.

If we move forward almost 10,000 years to the year 1890, in 1890, CO_2 in the atmosphere was 280 parts per million. It took just about 10,000 years for CO_2, a greenhouse gas, which helps the balance of Earth's climate, it took almost 10,000 years for it to increase almost 100 parts per million.

Now, let us look at the year 2000. In the year 2000, CO_2 was 380 parts per million. In effect, the natural causes before the Industrial Age were really in full swing. The natural causes gradually warmed the planet over 10,000 years very slowly.

What we have seen in the last 100 years, actually, about the last 50 years, is a dramatic increase in the amount of carbon dioxide in the atmosphere, something like we have not seen for hundreds of thousands of years and perhaps millions of years. So CO_2 in the atmosphere right now is 380 parts per million. We haven't seen that much CO_2 in the atmosphere for 800,000 years. Now, as a result of this, we are going to see some changes in our climate.

Let me make this last comment, though, about CO_2 in the atmosphere, about the heat balance, about how the greenhouse gases intermix with the atmosphere. Human activity, burning fossil fuel, has put into the atmosphere in a little more than 50 years what the natural processes took out of the atmosphere, and it took more than millions of years to effect. In less than 100 years we have changed the atmosphere more than the natural processes of the Earth have changed the atmosphere in millions of years.

Now, what are the ramifications of this? Well, warmer seas and warmer temperatures. If we want to associate

that with hurricanes, we have more frequent, stronger hurricanes as a result of that. Warm seas are fuels for hurricanes.

What is that doing to our economy? What is that doing to our coastal communities? What are some of the other implications?

Well, one other significant implication is sea level rise. If you went to Ocean City 10,000 years ago, and we know Ocean City in Maryland was not there 10,000 years ago, if you went to Ocean City, where Ocean City was supposed to be 10,000 years ago, you would have 75 more miles to go before you got to the ocean; 10,000 years ago you would walk from Alaska to Russia, easily, there was a land bridge, a wide land bridge.

Today we know that you can't. That is because sea level has been rising, and it has been rising because of the natural consequence of global warming, but now there is a significant change. For example, the temperature has increased, sea level temperatures have increased. In the last 20 years we have lost 40 percent of the volume of the Arctic ice. The Arctic ice cap, we have lost 40 percent of the volume of that.

Let us take a look at Greenland. In Greenland, it has 630,000 cubic miles of ice, Greenland, 630,000 cubic miles of ice. If that were all to melt, sea level around the globe would rise 23 feet.

Now, we know that Greenland's ice shelf is melting. Recently it was discovered that it is melting 10 times faster than anybody could have ever anticipated. A few years ago, it was losing about 80 cubic miles of ice a year, a few years ago. Today, just a matter of a few years later, it is losing now, and it is accelerating, 80 cubic miles of ice are melting every year.

When I say melting, it is not dripping. This is running off. In fact, the greatest contributor to fresh water to the world's oceans is not the Nile River, it is not the Amazon River, it is ice melting, pouring off the ice shelf of Greenland.

What is that going to do to our coastal communities, our coastal economies? What happened in Katrina, in Louisiana and Mississippi and Alabama? What is happening in a fairly more frequent occurrence to States like Florida or South Carolina, or even States like ours, the State of Maryland? What other changes might there be?

CO_2, carbon dioxide, is being absorbed at an increasing rate by the world's oceans. How will the oceans change as a result of this absorption of CO_2? It will become more acidic. The ocean chemistry will actually change in the ocean, and it will become more corrosive.

What is the problem with an acidic ocean that is more corrosive? Some of the best habitats in the world for the world's most abundant fisheries are coral reefs. Coral reefs cannot survive in an acidic ocean. A whole host of ocean creatures will be disrupted in their process to reproduce or in their process to exist at all. There will be warmer temperatures in the atmosphere, increased forest fires, increased infestation, increased invasive species, changing in agriculture practices, changing in weather patterns. There would be more significant rain storms, more significant snow storms.

Storm cycles would be difficult to predict, shifting in vegetation zones, habitat lost for a whole range of flora and fauna species and 40 percent of ice lost in the Arctic ice shelf right now, and accelerating, may be gone by this midcentury, a whole range, including polar bears or endangered species.

The coastal economy, the coastal economy in the United States is 50 percent of our GDP, 50 percent of our GDP. The likelihood of sea level rise as a result of all of this is going to be between 1, and more likely, at least 3 feet, that will clean out, wipe out, disturb, destroy most of the coastal cities in the United States on the Atlantic and gulf coast.

We are looking at New York City, Boston, Wilmington, Baltimore, Philadelphia, coastal areas from Maryland down to Florida, including Miami. Much of the peninsula of the State of Florida will be under water, not to mention, if you look at the State of Maryland, much of the peninsula, the Delmarva peninsula.

The natural range of fluctuation has been disrupted by the burning of fossil fuel, by oil, a limited resource, the end of the Oil Age and what are the consequences, the last 100 years of the Industrial Age, the age of fossil fuel, the natural range of fluctuation for CO_2, methane gas.

The temperature range in the last 10,000 years has been fairly close and predictable. Now, imagine a straight line, and what does a hockey stick look like? We have corresponded the increase in CO_2 with the increase in atmospheric temperature, the increase in land temperature, and the increase in sea level temperature. All of this corresponding to the increase in burning fossil fuel, and as a result, the increase of methane carbon dioxide.

I want to end with a quote from a gentleman called Norman Cousins, who had an illustrious career in journalism and in politics. Norman Cousins says, ''Knowledge is the solvent of danger.'' And the key to the successful understanding and opportunities for a brighter outcome with what Congressman BARTLETT is talking about as ''peak oil,'' the end of the age of oil, and its consequences in global warming, the key to understanding and finding a solution is knowledge.

Mr. BARTLETT, thank you very much for the time.

Mr. BARTLETT of Maryland. What the gentleman has been talking about is more than valid reason for pursuing the development of alternatives, if no other. Why would we want to increase CO_2 more? Why would we want to threaten more the quality of life in this world?

The Congressman and I have been to Antarctica twice; one of those trips we went together. Down in Antarctica, 90 percent of all the fresh water in the world is locked up in the ice there. It is nearly 2 miles high, and 70 percent of all the world's ice is locked up in Antarctica. Now that hasn't really started to melt yet, although it has threatened. I am told that calculations indicate that if the polarized caps in the Greenland ice shelf, if they were all to melt, the ocean levels would rise 200 feet.

Now, if you look around the world you will note that a big percent of the world's population lives within 200 feet of sea level. This would be a monstrous, monstrous change.

There are three very good reasons for pursuing alternatives, which is what the bill tomorrow is going to be talking about. One of those is certainly a climate change, because what we are doing now is releasing CO_2 that was bound up in these plants and organisms that grew aeons ago, and it took many, many years to tie up the CO_2. Now we are releasing it very quickly as we burn these fossil fuels.

A second reason, of course, is I just don't think that the oil is going to be there, which is what we are talking about tonight as ''peak oil.''

The third really good reason for doing it is the reason the President advanced, and that is, it really is a big national security risk to be so dependent on foreign oil.

What I have here on this chart is another depiction of Hubbert's peak, and this is by the Cambridge Energy Research Associates, commonly referred to as CERA, and they are trying to indicate that one should not have confidence in the predictions of Hubbert because his curve didn't exactly actually follow his prediction.

Well, by golly, it is pretty close to actually following his prediction. Here is the U.S. actual production in red. You will see there is a little second peak here, and the next chart will show that is because of Prudhoe Bay. We found a lot of oil there, but that was not in M. King Hubbert's prediction. He hadn't imagined that we would be going to the North Slope of Alaska to drill.

So the little yellow ones here are his prediction. Notice that the actual Lower 48 has followed very closely, very closely, his prediction. We are now down to, even with Prudhoe Bay, we are now down to about half, about 5 million barrels a day. That is the red one over there, as compared to roughly 10 million barrels a day at our peak.

The next chart shows better where their oil comes from. Hubbert's prediction covered the Lower 48, and that is this gray area here. Now we need to add to that gas liquids. The big find in Alaska here, and that is what causes this little blip here in the downward slope. I remember a number of years ago, these fabulous discoveries of oil in the Gulf of Mexico, which is supposed

to solve our problem for the foreseeable future, that is the yellow there. Notice it hardly makes a shadow on the downward slope of Hubbert's peak.

The next chart is really a chart that we could spend a long while talking about because it has a great deal of information on it. The bars there represent the discoveries, and you notice that we were discovering oil way back in the 1930s, big discoveries in the 1940s, and then lots of discoveries which peaked about 1970, and since then it has been going down, down, down.

The solid black line here indicates the amount of oil that we have been using. Notice that for a long while we were accumulating big reserves of oil; everything about this solid black curve is reserves that we have in store that we can use later.

□ 2115

But then in about 1980 there, you can see these two curves cross. I say two curves, because obviously you could draw a smooth curve through the peaks here, and these two curves crossed about 1980. Ever since 1980 we have been burning more oil than we found. Today we burn two or three barrels of oil for every barrel of oil that we find. So for this period, between 1980 to the present, we have been using up some of the reserves that we have back here, but still a lot of those reserves remain.

Now, what will the future look like? Well, there is a big difference of opinion in what the future will look like. The persons that put this chart together believe that by about 2010, about 3 years or so, the world will peak in oil consumption. Some believe that it has already peaked, others believe it may peak a little after 2010, and then it will go down.

Now, they have made some guesses as to how much oil we are going to find. I am not sure I would have drawn that curve exactly that high, because a smooth curve might bring you down about here. I think they have been very generous in the amount of oil that is yet to be discovered.

By the way, the world's experts on oil believe that we have, most of them, we have probably found about 95 percent of all the oil that we will ever find. You notice that when we find oil now, we find it in very difficult places to get to. The last big find was in the Gulf of Mexico, through 7,000 feet of water, and then about 30,000 feet of rock and dirt until you get down to the oil. We aren't now developing that field, and I am told, you can be told a lot of things that aren't true and I don't know the veracity of this, but I am told we will be developing that field when oil reaches $211 a barrel, because that is what it will cost to get the oil out of that field.

I just want to spend a moment looking at this before we go to the next one. If you draw a smooth curve through these bars, the area under that curve represents the total amount of oil that we have found, and the area under the consumption curve will represent the total amount of oil that we have consumed.

Now, it is very obvious that you can't consume oil that you haven't found, and you can make the future, within reason, look anyway you like. But what you can't do is pump oil that you haven't found. Unless you believe that we are going to find a whole lot more oil than indicated by their projection, then you have some choices as to what that downslope is going to look like.

You can be very aggressive and use enhanced recovery techniques, you can pump steam down there, you can pump CO_2 down there, you can flood it with sea water as the Saudis do to get their oil out. You get it more quickly. But if you get it more quickly, you have less to get later on.

So we have choices facing us as to what that downslope will look like. But, remember, you can't pump oil you haven't found, and the area under the consumption curve cannot be larger than the area under the discovery curve. They have to be the same area ultimately, the same volume.

Here is a prediction by our Energy Information Agency, and it is a very interesting one, and they use some unusual statistical approaches. But this is a curve through the discovery peaks. Let me put the other one up just quickly so you can see the similarities here.

Notice the big peak here in the late 1940s and 1950s and another peak here. They have kind of smoothed that out here. You can see this is the early peak here and then the later peak and then down, down, down.

We get to the point we are at now, and they make some very unusual predictions. The yellow line there, they say, is the 95 percent probability, and the green line is the 50 percent probability, and the blue line is the 5 percent probability. And they say that the 50 percent probability is the average, the mean, and, of course, probabilities and means don't mean the same thing, so therefore, that is what our production is more likely to be.

Surprisingly, this curve that has been going down for a number of years they thought was going to turn around and go up. But notice for the roughly 5 to 10 years after they drew this first curve, notice the red symbols there. They have been following what you would expect they would follow, and that is the 95 percent probability. Ninety-five percent probably is a whole lot more probable than 50 percent probable, and that is what it has been following.

Here is another chart from CERA, and it shows something very interesting. First, I want to look at the left here. This is the low, they say, is the 95 percent probability. Now, the 95 percent probability is the most probable, so it is not the low, it is the most likely.

Then they say the high probability is almost 4,000 gigabarrels. The mean is right in the middle. Most of the experts in the world believe that we have found about a little over 2,000 gigabarrels of oil. I use the term ''giga,'' because a billion in England is a million million, and in our country a billion is a thousand million. So everybody understands giga. A giga is a thousand million. We have consumed about half of that and about 1,000 gigabarrels, maybe a little bit more, but roughly a thousand gigabarrels remains.

Several Congresses ago I was privileged to share the Energy Subcommittee on Science, and I wanted to get some idea of the dimensions of the problem we face, so we had the world's experts come in for a hearing. And I was surprised at the unanimity. It was like from 970 to 1,040 gigabarrels of oil remaining in the world, not a big spread.

Now, what they are showing here is that if in fact we find as much more oil as all the oil that now remains discovered, if we find as much more as all the oil that remains discovered, we will still peak at 2016, 9 years from now, if we find as much more oil as all the oil that now exists, that we know exists in the world. If you don't find that, then we peaked about now and it is going to start down this way.

Another thing they have shown here is if you aggressively develop these fields and pump life steam down there or put CO_2 down there or pump sea water down there, you can get it more quickly. But then look what happens. It falls off more quickly too.

Again, the area under this curve has to be the same thing as the area under this curve. You can't pump more because you are pumping it faster. Now, with enhanced oil discovery, you might get a little more, because you might get some oil that you wouldn't have gotten with conventional techniques.

Here is another more recent chart from the Oil Information Agency. They have been pooh-poohing the idea of peak oil. They said it was going to be an undulating plateau. I agree, it is going to be an undulating plateau. So they show here with what I think are wildly optimistic estimates of how much oil we are going to find, they believe that we are going to find twice as much more oil as all the oil we now know exists. That just isn't very probable.

But even if we find that much oil, they have a peak. Notice it. They say it is an undulating plateau. I agree. With the world's economies and demands and warmer temperatures, which is why oil is down a bit now, because we have warmer temperatures in our country, I agree it is going to be undulating plateau. They are pooh-poohing the idea of peak oil, and they show in this curve peak oil. They show it I think a good many years beyond when it will actually occur.

This little curve down here is closer what I think is reality. They have 1.92 trillion, and it is just a bit over 2 trillion, I think, so maybe it would extend

a little beyond this. But notice they are showing this peak about now, aren't they? So if we don't find this enormous amount of additional oil, it will be peaking about now. What they are saying is if we have only 2.93 trillion, we will be peaking at this point.

I have a quote here from one of the world's experts on oil, Dr. Laherrere, and this is what he says, and I think that it is kind of difficult to argue with his logic. Jean Laherrere made an assessment of the USGS report.

Now, it is the USGS report that provides the data that permits CERA to make their prognostications. He concludes that the USGS estimate implies a five-fold increase in discovery rate and reserve addition for which no evidence is presented. Such an improvement in performance is in fact utterly implausible, he says, given the great technological achievements of the industry over the past 20 years, the worldwide search and the deliberate effort to find the largest remaining prospects. Today we have 3–D modeling and seismic use, and so we know pretty much what the world's geology looks like.

I might take just a moment to talk a little bit about this geology, because it is very important in understanding how much more oil we are likely to find.

How did the gas and oil get there? Well, nobody was there when it got there, so we really don't know, but one of the best guess its is that a very long time ago the Earth was very much warmer than it is now. As a matter of fact, there were subtropical seas at the North Shore of Alaska. In the North Sea, there were subtropical seas. And every cycle the vegetation grew, and then when it matured or if there was a fall, and it may have been warm enough there was no true fall, but still there was a cycle of life, and it grew and sank to the bottom as algae does now in the ponds and so forth. And then waters washed erosive materials off the surrounding hills and it mixed with the organic material. This continued for an a large number of years until there was a lot of mixture of organic material and inorganic material there.

Then the tectonic plates of the world moved, and we know that happened, and it opened up and sank and went down to a depth where the temperature was appropriate, closer to the molten core of the Earth, and where the pressure was appropriate, and then cooked there under this pressure for who knows how long, and this organic material, mostly plants, maybe a few small animals, gradually became what we know as oil.

Now, the oil is made up of molecules of varying lengths. Some are very short and they are in fact gasses, if you let them escape from the oil. Some of them are very long, and that makes the waxes and so forth that we find in oil.

Now, if there happened to be a rock dome over top of this deposit way down there that is now being cooked and pressurized for a long while, if there is a rock dome over that, the gas that escapes will be trapped under that rock dome. So when you come along and drill a well through that, and you get down to the oil, the oil is going to be under pressure because of that gas above it. So you have what you call a gusher. The gas pressure above pushes the oil down and up the drill pipe and it continues to gush until that gas pressure has been relieved.

Now, this may not be the way that oil and gas were formed, but there isn't any better guess as to how it was formed. And if that is in fact the way it was formed, then we can make some guesses as to how much more oil and gas we are likely to find, because we have done a pretty good job of matching the geology of the Earth.

What you need to find is some of this organic material buried deeply for a long while with a rock dome over it so it captures the gas. By the way, if it doesn't capture that gas, you end up with something like the tar pits of California, and you end up with the tar sands, they call them oil sands, they are tar sands, thank you. They flow about as readily as the blacktop driveway out here, unless you heat them up, which is what they do, and combine them with some shorter chain molecules so that when they cool they will still flow.

The loss of these gasses has produced what we call our oil shales in the west. By the way, there are huge, huge deposits of these tar sands and oil shales.

As a matter of fact, the deposits of each of those represents way more than all the fossil fuels that we now know exist in the world, and the Canadians are making some heroic efforts because their big fields are up in Alberta, Canada, and they have a shovel up there that lifts 100 tons and they dump it into a truck that carries 400 tons and then they carry it and cook it. When it is cooked, why, the oil flows and then they mix it, as I said, with something with shorter molecules, a solvent, so when it cools it will flow and they move it out through pipes. With this heroic effort, they are getting about 1 million barrels a day. That sounds like a lot, 1 million barrels a day, but we use 21 million barrels a day. That is about 5 percent of what we use, and just a bit over 1 percent of what the world uses, because the world uses about 84–85 million barrels a day.

And what they are doing is not sustainable, because they are cooking this with natural gas that is what we call stranded. By ''stranded'' we mean there are not very many people there to use it, and natural gas is hard to transport unless you liquefy it and are near a port, so it is cheap. So I understand they may be using more energy from natural gas to produce the oil than they are getting out of the oil. But from a dollar and cents perspective, it makes sense, because the gas is really cheap and they are producing that oily understand for $12 to $25 a barrel, again, you get various estimates of this, and they are getting $50 to $60 barrel for it. So dollars and cents-wise, that makes good sense.

□ 2130

From an energy profit ratio, it does not make any sense at all. Natural gas is a high quality feed stock for an enormous petrochemical industry.

One of the things that we use it for, by the way, is making nitrogen fertilizer, and without our ability to make nitrogen fertilizer, we could not begin to feed the world. It is not just the plant breeder, and he has done marvelous with developing new plants. It is all of the fossil fuel energy we use in agriculture, and a great deal of that is used in making nitrogen fertilizer from natural gas.

I have next a little schematic here, and this kind of smoothes out these curves. By the way, the world has been increasing its use of oil about 2 percent. That does not sound like much, does it, 2 percent? But 2 percent exponential growth doubles in about 35 years. It is four times bigger in 70 years, and it is eight times bigger in 140 years.

Albert Einstein was asked after the discovery of nuclear energy and the detonation of the nuclear bomb, Dr. Einstein, what will be the next great energy force in the world? And he said the most powerful force in the universe is the power of compound interest. Exponential growth.

I have a namesake, no relative. I wish I had some of his genes. He is really very brilliant. Dr. Albert Bartlett, professor emeritus at the University of Colorado, he gives the most interesting 1-hour lecture I have ever heard on the failure of our industrialized society to understand exponential growth. Just do a Google search for Albert Bartlett and energy, and it will come up and you will be fascinated with this 1-hour lecture.

Here we show this little schematic curve. It is a 1 percent growth rate. Remember, that doubles in 35-years. This point is twice as high as this point, and that represents 35 years. Notice that the shortage occurs before we reach the peak.

The shape of the bell curve and the exponential growth curve indicate that you are going to have shortfalls in supply, price is going to go up before you might reach the peak, and maybe, just maybe, we are in this time right here. A lot of the evidence indicates that is true.

The next chart is one that really gives you some pause when you look at it. Let us just look at the upper one because the bottom one is an expansion of the upper one, separating the gas from the oil here in the red curve. But this shows only what 400 years, a little less than 400 years of more than 5,000 years of recorded history. The use of energy in our world was so small back in 1750 that that brown there which is

wood is just about the baseline, is it not?

The industrial revolution started with wood. The hills of England were denuded to make charcoal to make steel. Catoctin Furnace, a little historic site up in Frederick County, they denuded the Catoctin Mountains where Camp David now is, thankfully the trees grew back, they denuded that making charcoal for that furnace.

The industrial revolution really took off when they discovered coal, and it was stuttering when they finally discovered gas and oil. Then look what happened.

The hockey stick, that is the hockey stick that Congressman GILCHREST was talking about, look what it did. It just goes straight up. Notice here what happened in 1970. There was a real oil price shock there, and the world used somewhat less oil. We are now very efficient in the way we use oil in this country. Air conditioners probably are twice as efficient at least as the ones you used in 1970. If it were not for our increased efficiency we would be in even more trouble with energy today.

But what I want to point out is that we are about 100, 150 years into the age of oil. That is this. If Hubbert was right, and he was exactly right about the United States, why should he not be right about the world, this is going to be a bell curve. By the way, you can make this thing look steeper or shallower depending upon the dimensions and the ordinates, the absinthe ordinate and abscissa. Here, of course, we have 400 years on the abscissa so it is very compressed so it makes the curve look higher, but that is exactly the same kind of curve we have here. We just spread out the abscissa here so that we spread it out. If you really push these two things, that is going to peak up high in the middle.

Out of 5,000 years of recorded history, the age of oil will represent about 200 to 300 years, remaining about 100, 150 years. What will our world look like post age of oil?

The next chart shows us something that is alarming a number of people, and this is a little drawing of the world. It has a number of symbols on it, and one of those symbols shows where China is securing rights to buy oil, and they are all over the world. This symbol here was Unocal. They almost bought Unocal, one of our oil companies. They are buying oil all over the world. They are scouring the world for oil.

I just came back from a trip to China, and we went there to talk about energy by the way. I was pleasantly surprised when they began their discussion of energy by saying post-oil. They get it. I wish we did. They talk about post-oil. They recognize that they are big polluters. As a matter of fact, I have a reference here that says by 2010, just 3 years from now, they will be a bigger CO_2 producer than we are, in just 3 years. Their economy is growing, the last 2 quarters, at more than 10 percent a year. That doubles in 7 years. It is four times bigger in 14 years. It is eight times bigger in 21 years, 1.3 billion people. I saw essentially no bicycles on the street and traffic jams like we have at rush hour here in Washington.

Well, the fact that they are scouring the world for oil indicates their understanding that this is going to be a resource in short supply for the future. We can spend a long time talking about China and what they are doing. They are aggressively building a blue water navy.

A blue water navy is different than the brown water navy, brown from the silt that comes out the rivers near shore, little navies that protect you from somebody coming from afar. They are rapidly developing a blue water navy. Last year, for instance, we launched one submarine. They launched 14. Now, their submarines are not ours but 14 submarines is 14 submarines.

I have here a very interesting statement from our Secretary of State Condoleeza Rice: ''We do have to do something about the energy problem.'' I am thankful you recognize that. ''I can tell you that nothing has really taken me aback more as Secretary of State than the way the politics of energy is I will use the word 'warping' diplomacy around the world. We have simply got to do something now about the warping now of diplomatic efforts by the all-out rush for energy supply.''

It would be nice if everybody in the administration understood that and we were doing something meaningful about it.

So what do we do? Well, I think that any rational person would understand that you need to get busy developing some alternatives if you are going to run out of these fossil fuels. By the way, these fossil fuel are just incredible. The energy in these fossil fuels is just unreal.

I have an article, really not an article. It was a speech given by Hyman Rickover in 1957, 50 years ago this year, and I want to read something that he says here which is really interesting. He understood 50 years ago, ''With high energy consumption goes a high standard of living. Thus the enormous fossil fuel energy which we in this country control feeds machines which make each of us master of an army of mechanical slaves. Man's muscle power is rated at 35 watts continuously,'' little more than you are working, but you have got to sleep, ''or one-twentieth horsepower. Machines therefore furnish every American industrial worker with energy equivalent to that of 244 men, while at least 2,000 men push his automobile along the road, and his family is supplied with 33 faithful household helpers. Each locomotive engineer controls energy equivalent to that of 100,000 men; each jet pilot of 700,000 men. Truly, the humblest American enjoys the services of more slaves than were once owned by the richest nobles, and lives better than most ancient kings. In retrospect, and despite wars, revolutions, and disasters, the hundred years just gone by may well seem like a Golden Age.''

And it has gotten even more golden in these last 50 years, has it not?

Hyman Rickover understood very well our dependence on fossil fuels. One barrel of oil controls the energy of 12 men working all year for you. If you figure out what that costs, it is less than $10 to purchase the equivalent work of a person all year long.

Now, if you have some trouble getting your minds around that, imagine how far that gallon of gasoline or diesel fuel carries your car. And by the way, it is considerably cheaper, a little over $2 a gallon, than water in the grocery store.

Now, how long would it take you to pull your SUV or your car or push it as far as that little gallon of gasoline or diesel fuel take it? I own a Prius. We get under normal road driving conditions 51 miles a gallon. It would take me a long time to pull my Prius 51 miles.

Another indication of the incredible energy benefit from fossil fuels, if you work really hard all day long, I will get more work out of an electric motor for less than 25 cents worth of electricity. It may be humbling to recognize in terms of fossil fuel that we are worth less than 25 cents a day, but that is the reality, and that is why we live so well.

As Hyman Rickover understood 50 years ago, if that was true what he said 50 years ago, it is true in spades today, is it not, because we have even more helpers to make our life quality higher as a result of our use of energy.

Well, what do we do if we are going to run short of fossil fuels? Obviously, we have no surplus oil to invest in the development of renewables. If we did, oil would not be $50, $60 a barrel, but we can free up some oil and buy some time with a very aggressive conservation program.

Matt Simmons, who has written a really good book on Saudi Arabia called ''Twilight in the Desert,'' and he makes the case that Saudi Arabia has probably peaked in oil production. They will not tell you that, but you notice they cannot make good on any promise to increase oil production so he may very well be right. Then after having freed up this energy and bought some time, we must use it very wisely. We would get a lot of benefits from that.

Life is just so easy in this country that we are bored. We are watching awful movies. We are doing drugs because we are bored. There is no exhilaration like facing a big challenge and besting that challenge. There is nothing that puts flavor in pie so much as work, and I can imagine Americans, when they understand the problem we face, going to bed at night saying, gee, today, I used less energy than I did yesterday and I lived just fine, and tomorrow I am going to do better.

But we need leadership that is not here yet so that we will do that. By the way, big benefits. We could once again become a major exporter. We are the most creative, innovative society in the world. Properly challenged, we will figure ways to get this alternative energy. We could again be a major exporter. Today, we are a big, big importer, as you know, $800 billion trade deficit this year.

We are a role model whether we like it or not. When you use 25 percent of the world's energy, you are a role model. Not a very good one today. We profligately use energy, way more energy than the average person in the world. It really is possible to be much more efficient.

This is a fascinating chart, such a simple one, but what it shows is the heat that you get out of an incandescent bulb and the light you get out of it. Ninety percent of it is heat which is why I use an electric bulb for brooding little chickens. I am not so much interested in the light as I am the heat from it. Now fluorescents are much better, and I saw there was a Time magazine cover page that had a pile of coal there. I think it was on the cover page, and they have one of these screw-in fluorescent bulbs beside it. Five hundred pounds of coal, that is the amount of coal you save in the life of that one fluorescent bulb, that is here.

But notice what you get out of light omitting diodes. I have a little light omitting diode flashlight that I carry. I put two little batteries in it, and I have forgotten when I put them in.

□ 2145

It just lasts so long. We have the same amount of light out of each one of these, but notice the enormous amount of heat you are getting out of the incandescent bulb and the tiny amount of heat that you are getting out of the light emitting diode.

There are lots of opportunities in our society to live well and comfortably using a lot less energy. I don't have the chart here, but the average Californian uses only about 65 percent as much electricity as the rest of America, and it would be hard to argue that Californians don't live well.

This next chart is a really interesting one, and what it shows here on the abscissa is the amount of energy that we are using per person and what it shows on the ordinate here is how good you feel about life. You couldn't feel any better than 100 percent, and notice where we are. We are the biggest users of energy in the whole world and we feel pretty good about it; but notice how many countries that use less energy than we feel even better than their quality of life. Let's go way back here to Colombia. They use a fifth as much energy as we; they feel almost as good about their quality of life as we feel.

If you drew a curve through this, you need some minimum energy to feel good about life, but once you go up that steep part of the curve, the minimum energy is pretty flat. We can move way back here on the curve and feel just as good as we do now about life. You don't have to use the amount of energy that we use to feel as good about life as we do.

The average European, the countries are scattered through there, but the average European uses half the energy we use and, by the way, pays more than twice as much per gallon of gasoline and they have been doing that for a very long time.

We are shortly going to run out of our 60 minutes this evening and we will need to come back to finish this, but obviously we have got some finite resources here that we can use. When we come back, we are going to talk about the resources available to us to meet the challenge of transitioning from fossil fuels to renewables. And, by the way, we will transition either on a time scale that we have chosen or on a time scale chosen by geology.

As we run down the other side of Hubbard's Peak and the world has less and less supply of fossil fuels, we will transition. It can be a bumpy ride, or it can be a really bumpy ride. But Americans are up to it. We need leadership and knowledge. And we will be back again to talk about the finite resources available to us and all those fascinating opportunities in renewables.

CLEAN ENERGY

The SPEAKER pro tempore. The gentleman from Washington (Mr. INSLEE) is recognized for 60 minutes.

Mr. INSLEE. Mr. Speaker, we come here to the well tonight to continue this discussion about energy. I have enjoyed listening to my colleagues Mr. BARTLETT and Mr. GILCHREST, who have been talking about the need for changes in our energy policy to effectuate an energy efficiency policy for this country, to use our innovative talents to come up with new technologies to deal with our energy challenges, and to really bring our energy policy from the 19st century into the 21st century. And the good news is tomorrow, Thursday of this week, in just the third week of the 110th Congress, this new Congress is going to start with a big step out of the 19th century, which has been represented by the last Congress, and into the 21st century, which is represented by this Congress, and I am pleased to report to the House tonight and to the country, tomorrow the Democratic majority with some help from some of our friends across the aisle will pass a bill which will cause a major shift in the energy policy of this country.

In the last Congress there was a clear direction of the energy policy of this country, and under the last management of the U.S. Congress the basic operative rule was to give billions of dollars of taxpayer money to the oil and gas industry, the most profitable industry in the history of the solar system, over $10 billion in tax breaks to the oil and gas industry. Tomorrow, that money will be returned to the citizens of the United States for the use in developing a truly 21st century energy plan.

Tomorrow, the Democratic majority held Congress or House of Representatives will pass a bill which will reel back in $14 billion of taxpayer money that was sent to the silk-lined pockets of the oil and gas industry, and that is a good thing for Republicans and Democrats and Independents and for our grandchildren for reasons we will talk about tonight. It is a good reason because when we reel that $14 billion in giveaways to the oil and gas industry that happened in the last Congress, what we will do tomorrow is take that $14 billion and create a fund of money belonging to the American people that will be used for the development of new technologies, creative new sources of energy, energy efficiencies, more efficient vehicles, more efficient appliances, and a way to beat global warming.

So we are going to convert the giveaways from the oil and gas industry that happened in the last Congress to an investment in the future of our country to have a new energy technology, technologically based future for the energy source of this country. We are going to do it for three reasons. And perhaps those three reasons are obvious, but I want to state them.

Tomorrow when we pass this bill, we will create a fund called the Strategic Renewable Energy Reserve. Not really much of an acronym; I didn't get to name it. But the Strategic Renewable Energy Reserve will be a fund with $14 billion that will be taken back from the oil and gas industry and be used for our inventors, our businessmen, our academicians, our people who are doing great work to develop new sources of energy, and we will do this for three reasons. I will go through them quickly.

Number one, we will use this fund to develop a domestic source of energy for this country. We will use this money to develop the new advanced biofuels, the second generation ethanol, the cellulosic ethanol, the advanced biodiesel systems so that we can start buying our fuel from Midwestern farmers rather than Middle Eastern sheiks. We know the trouble we are in in the Middle East due to our dependence on Middle Eastern oil, and we are going to break that oil addiction, not rhetorically, but in reality.

Second, we are going to use these funds to develop new clean energy sources that can stop global warming. We are going to have energy efficiency which can have efficient appliances rather than dirty appliances that waste energy. We are going to have energy efficient cars, plug-in hybrids, flex fuel vehicles that can use biofuels developed in the Midwest; energy created by wind turbine, solar energy and perhaps clean coal, wave power. You name it.