this majority, we have had no regular order. We have no rules. They did go in and make a change to make it easier to raise taxes.

As I said, hold on to that wallet because they are coming for it. They actually made it easier to raise taxes on the American people.

They even want to get into committees and not record votes so that you will not know what they are doing in the Rules Committee and in some of the committees so that you can play both sides of the aisle on these issues.

In addition to the energy bill that was passed today, they also passed a bill dealing with student loans. It is not going to do one single thing to help get one student into college. They were dealing with interest rates after, after, you leave college.

They decided they wanted to rework a Medicare prescription drug plan. Well, do you know what? Over 75 percent of the seniors are satisfied with the prescription drug plan; and here they go, they are wanting to make that one more expensive.

With the 9/11 Commission, we heard from our transportation industry, from companies large and small that transport goods and merchandise that it would be a cost of billions and billions of dollars to the American public.

The minimum wage bill that brought about Tunagate, my goodness, $5 billion to $7 billion worth of added cost to the small businesses, plus our fiasco with Tunagate that was carried forth by the gentlelady from California.

So it has been an interesting 100 hours. They did pass their energy bill today; and as has been said, it is not a bill, Madam Speaker, that is going to make gas cheaper at the pump, more affordable, or make the U.S. less dependent on foreign oil. It will make it more dependent on foreign oil.

I yield back to the gentleman from Texas.

□ 2130

Mr. CONAWAY. I thank the gentlewoman for coming back from her previous engagement this evening to join my colleague from New Mexico. We are just winding down. Does my colleague from New Mexico have another point or two he wanted to make?

Mr. PEARCE. Yes. I would comment to my colleagues that a government depends on the confidence of the people. We make promises all the time, and we are expected to honor those promises if we are going to be a good government. We make promises to our seniors. We make promises to our veterans. We make promises to our young men and women who serve in the military that we will watch out for them, that we will take care of them.

But like the gentleman says, we also make written contracts and written agreements. In this bill today, we have undermined the contracting process. We have declared that previous agreements simply must be renegotiated or you give up all future rights, and when we as a country choose to do that, not only do we offend and compromise our constitutional protection of private property rights, we undermine the confidence in our Nation and in our government.

This is such a very serious step. It is a step that other Nations take very easily and yet is so significant, and yet this major step, this change in American policy was done without one single committee hearing.

This bill that was in front of us today, H.R. 6, should have gone to four different committees. Instead, it went to none, not one committee hearing, and there were new provisions in this bill. There were new people on the floor who were elected just this year who have not heard the old provisions. I do not disagree with my colleagues who wanted to make us energy independent, but they failed in that task, and in the process, they have begun to undermine the confidence of this great Nation and the great reputation it has for treating fairly those people who invest and those people who trust the government.

Who else will be undercut by actions from the floor of this House and the Democrat majority that is willing to take any step to try to enforce a new standard while declaring it to be a new way? Instead, it is an old, tried way that many other Nations have tried in the past. It is unfortunate to see now this Congress and this majority taking steps that Russia or Bolivia might have taken.

I thank the gentleman for yielding time to me.

Mr. CONAWAY. I appreciate the gentleman from New Mexico being with us tonight.

On the campaign trail and in the town hall meetings throughout my brief career, I have talked about Social Security being basically a contract with ourselves, a promise with ourselves, that we would not break that. From now, every time I talk about that, I will have to think about this legislation, have to think about the fact that, wow, here is a written contract, much like the written provisions of Social Security, much like the written provisions in our veterans' benefits, that we tend to keep but here is one that we did not.

I appreciate both my colleagues coming tonight. Here is one final thing. I go through the long list of co-sponsors on this bill. At the end of it, it says they have introduced this bill and it has been referred to the Committee on Ways and Means, Natural Resources, Budget and Rules for a period to be consequently determined by the Speaker. I do not think there is a stopwatch fast enough that could measure the amount of time that this bill laid before those committees because they did not work. So how those committees did meet, how they were able to get it through all four of those committees without anything happening, without any meeting is one of those well-kept secrets about how this process works when you do not have a transparency that a full committee process will have.

As I told them earlier this afternoon, I hope that my colleagues on the other side are not so intoxicated with this power that they now wield that they continue this process of not having committee hearings, not taking regular order, not moving things through in ways where at least we can point out the flaws in a format and in an arena in which it can be perhaps have an impact on the ultimate legislation.

So I want to thank the Chair for having us in here tonight.

PEAK OIL

The SPEAKER pro tempore (Mr. MURPHY of Connecticut). Under the Speaker's announced policy of today, the gentleman from Maryland (Mr. BARTLETT) is recognized for 60 minutes.

Mr. BARTLETT of Maryland. Mr. Speaker, last evening we were here just about this time talking about this same subject, the subject we have been talking about for the last hour. We had been discussing the phenomenon known as peak oil. That is the term given to a prediction that a geologist made, M. King Hubbert, working for the Shell Oil Company in 1956. He gave a speech in San Antonio, Texas, which I believe within a decade will be recognized as the most significant, most important speech given in the last century.

What he predicted was that the United States, which at that time was king of oil, we were producing more oil than any other country. We were using more oil than any other country, and we were exporting more oil than any other country. M. King Hubbert had the audacity in San Antonio, Texas, in 1956 to predict that in just a bit less than a decade-and-a-half, by about 1970, he said that the United States would reach its maximum oil production, and after that, inevitably, no matter what we did, oil production would tail off.

That prediction came true. Surprisingly, in 1970, some may say 1971, we peaked in oil production. In 1969, using this same analysis technique, he predicted that the world would be peaking in oil production about now. So last night we had come in our discussion to the point that we were looking at the potential for the alternatives that we and the world would need to turn to as we slide down the other side of what is referred to as Hubbert's peak. We noted that there were some finite resources, some nuclear resources and then the true renewables.

There are three justifications one might use for moving to alternatives. One is peak oil, and we will transition from fossil fuels to alternatives. Oil, gas and coal obviously will not last forever, and as the earth at some point runs down the other side of what we call Hubbert's peak and there is not enough oil, gas and coal to meet our energy needs in the world, we will transition to alternatives. The only question is whether we do that on a time scale that we control so that it is a pretty easy ride, or whether we do it as dictated by geology, where it may be a very difficult ride.

Two other reasons for moving to alternatives. One is our dependence on foreign oil. Today, we have only about 2 percent of the known reserves of the oil in our country. We use about one-fourth of all the oil in the world, and we import about two-thirds of what we use. Obviously, if M. King Hubbert was right about the world, and there is every reason to believe he will be right about the world, we will need to transition to alternatives.

From a national security perspective, we ought to have been doing this a long while ago. A couple of years ago, 30 prominent Americans, Jim Woolsey, Boyden Gray, McFarland and 27 others, wrote a letter to the President saying, Mr. President, and they used the statistics I just used, the fact that the United States has only 2 percent of the known reserves and uses 25 percent of the world's oil and imports almost two-thirds of what we use is a totally unacceptable national security risk. Mr. President, we really need to do something about that. So even if you think that there is a whole lot of oil and gas out there, you still may be very incentivized to look for alternatives if you are concerned about our national security.

There is another reason to look for alternatives, and that is, if you believe that we have global warming, and I think there is an increasing body of evidence that suggests that that is probably true, and that we are probably contributing to that, although in the past the earth has been very much warmer, this is in a very distant past. Ordinarily, the past that we are talking about is from the last ice age, which is like some 10,000 years back. It is now the warmest we have ever been since that last ice age, but sometime way in the past the earth has been very much warmer because there were apparently subtropical seas in what is now the north slope of Alaska and the North Sea because we are finding oil and gas there.

The general belief is that this oil and gas was produced by organic material that grew in these subtropical seas, that every season it matured and fell to the bottom and was covered and mixed with sediment that was washed off of the adjacent hills, and then that built up for a very long time. Finally, with moving, the tectonic plates was submersed down with enough pressure and enough heat from the molten core of the earth and enough time that this finally was processed into gas and oil, and then if there was a rock dome over it which would hold the gas, now you have a very fertile place in which to drill. It took a very long time to grow all of that organic material and to turn it into gas and oil.

We are now in a relatively few years releasing all of the carbon dioxide that was sequestered in this organic material over quite a long time, until we are driving up the CO2 of the world, which in the last century or so is nearly twice now what it was a century or so ago. This is what we call a greenhouse gas.

You can get some idea as to the greenhouse effect. If tomorrow is a sunny day and a cold day, and if your car is parked outside with the sun shining on the windshield, you may find quite a warm car when you go out there. That is because of what we call the greenhouse effect. The light that comes in from the sun, call it white light, it comes in over a long spectrum of wave lengths, and it goes through the glass of your car. Then it warms up the material of your car and it reradiates only in the infrared. Well, the glass of your car is pretty much opaque to the infrared. It keeps the heat inside. It reflects it back, and that is why your car gets so warm.

The greenhouse gases out there, you may remember being in an airplane, you are 44,000 feet, and the pilot tells you it is 70 degrees below zero, when down just below you may be flying over south Florida where it is very warm, and this is because of the greenhouse effect. The energy coming in from the sun heats up things in the earth, and when that heat is reflected back out, emanated back out, it is reflected by what we call the greenhouse gases and CO2 as one of those.

So there is increasing evidence that we have global warming, and there may be a need to move to the alternatives because many of these alternatives, although they will produce CO2 when you burn them like ethanol, that CO2 was taken out of the atmosphere by the corn plant when it grew. So you are not contributing any more CO2 to the atmosphere if you are using a product that just last year or so took the CO2 out of the atmosphere.

Now, what you would want to do in these last 2 cases is a little different in moving to alternatives. We have essentially run out of time and run out of energy to invest in alternatives. We absolutely knew by 1980 that M. King Hubbert was right about the United States. We had peaked in 1970. We have done nothing in the ensuing years. If M. King Hubbert is right about the world, we have no excess energy to invest or oil would not be $50, $60 barrel, which means we have essentially run out of time and have no energy to invest.

□ 2145

Now, we could buy some time and free up some energy with a very aggressive conservation program.

Now, if your concern is foreign oil, then you could also get some additional energy from such things as tar sands and oil shales and coal. But if your concern is global warming, this will be a very bad place to get energy to invest in the alternatives that we will ultimately have to transition to because it take a lot of energy to get energy out of tar sands, and that energy is fossil fuel energy and that releases CO2 into the atmosphere.

So you are making a bad situation worse if your concern is global warming and you think CO2 is the cause of that and you want to transition to renewables, and you are going to get the energy to transition to renewables from tar sands and oil shales and particularly in coal somewhat. You will simply be releasing more carbon dioxide into the atmosphere. But let's look at these, because if the other two incentives are your incentives, then these are good bets.

If you are simply concerned that we have got to transition to renewables, then you will use whatever energy is available, and there is potentially enormous amounts of energy available in these tar sands and oil shales. And if you are concerned about dependence on foreign oil, then this is a good place to begin.

The tar sands. Some may call them oil sands; they are tar, thank you. It doesn't flow; it is really very much like tar. It is, I guess, a bit better than the asphalt parking lot out here, but not much better. If you put a blow torch on the parking lot, that will flow, too, which is pretty much what we have to do with the tar sands. They exist in Canada around Alberta, Canada. There is an incredible amount of potential energy there. There is more energy in these tar sands than in all the known reserves of oil in the world.

But why aren't we resting easy, then, that we have got an easy transition, a big source of energy? Because this energy is not all that easy to get out of the tar sands. The Canadians are now getting about a million barrels of oil a day. That sounds like a lot of oil, and it is a lot. It is a little less than 5 percent of what we use in our country and just a bit more than 1 percent of the 84 million, 85 million barrels a day that the world uses; but they are using an incredible amount of energy to get this.

They are mining this, if you will. They have a shovel there that lifts 100 tons at a time, they dump it into a truck that hauls 400 tons, and then they take it and they cook it, and they are cooking it at the present with natural gas. They have what is called stranded natural gas there. There are not very many people in Alberta, Canada, that use it and gas is very difficult to move long distances; and so they are using this gas to produce oil from the tar sands.

I am told, and you can be told a lot of things that aren't true, but I am told that they may be using more energy from the natural gas than they are getting out of the oil that they produce. But from an economy perspective, that is okay, because the gas is very cheap and the oil is very expensive. And I understand it costs them $18 to $25 a barrel to produce the oil; and if it is selling for $50, $60 a barrel, obviously there is a big profit there. But this natural gas will not last forever.

And where will the next energy come from? They are talking about building a nuclear power plant there so they will have additional energy for cooking this oil.

And they have another problem. The vein I understand, if you think of this as a vein, it now ducks under a big overlay of rock and soil, so that they will not be able to continue to develop this by mining it which is what they are doing now. They will have to develop it in situ, and I don't know that they have any economically feasible way of developing it in situ.

So although there is an incredibly large amount of potential energy available there, it will take a lot of energy to get it out, so what you really need to be thinking about is the net energy or the energy-profit ratio that you get out of this.

Who knows what new technologies we may come up with, what the engineers may be able to do, but one should not be too sanguine that this will be a savior, that we will get enormous amounts of energy from this, because of the difficulty of getting the oil out.

The oil shales. The name might better be called tar shales, but we refer to oil shales, and they are found in our western United States, in Utah and Colorado and so forth. And, again, there is absolutely an incredible potential amount of oil that could be extracted from these oil shales, or tar shales. Probably more than all of the known reserves of oil in the world, if we could get it all out. There have been a couple of attempts to do that. The most recent one was by the Shell Oil Company, and there was some glowing reports in the papers about what they did there. But there are aquifers associated with this shale that they need to protect, and so what they do to develop this is to go in and drill a bunch of holes around the perimeter and then freeze it.

So they in effect have a frozen vessel, and the oil will not move through that frozen vessel. And then they drill wells in the middle of it and they cook it, and they cook it for a year. And then they drill a third set of wells, and then when they get to the bottom, they go horizontally. They are very good at doing that now. So the oil that they cooked, loosened up by the second set of wells they drilled, now flows down through the shale, into the well that they drilled that finally went horizontal, and then they pump it out of those wells, and then they pump it for several years and they get a really meaningful amount of oil out.

A couple of years ago I was out in Denver, Colorado, speaking to a peak oil conference there, and the engineer, the scientist who did this little experiment cautioned that it would be several years before Shell Oil Company decided whether it was even economically feasible to get any oil out of the oil shales using that technique. Now, there may be other techniques, but at present to my knowledge nobody has any big exploitation of the oil shales. The one that got the most publicity was this experiment by the Shell Oil Company, and they have indicated it would be several years before they can determine whether $60 a barrel is even feasible to get that oil.

The next one here is coal, and we will put another chart up in front of this one, because we hear a lot about coal. And you may hear it said that we have 250 years, 500 years of coal. We don't have 500 years, but we do have 250 years of coal at current use rates. Be very careful when people are telling you how much we have of some resource. If it is at current use rates, you have to factor in how long it will last you if you have an increased use rate.

After the development of atomic energy, and the world was amazed by that, Dr. Albert Einstein was asked: What will be the next great energy source in the world? And he said the most powerful force in the world was the power of compound interest.

And when you look at exponential growth, if you increase the use of coal just 2 percent, and I submit that we will have to dig into coal much more than just 2 percent increase per year over what we now use, but if it is only 2 percent, that 250 years immediately shrinks to about 85 years; and then you can't fill your trunk with coal and go down the roads. You have to convert it to a gas or liquid. And, by the way, we have been doing this for decades. Hitler ran his whole military and his whole country on oil from coal. When I was a little kid, the lamps that you now call a kerosene lamp we called coal oil lamp because it was coal oil that replaced whale oil in the lamps, and long after we were using kerosene I still called it coal oil.

But if you use some of the energy from the coal to convert the rest of the coal into a gas or a liquid, now you are down to 50 years with just 2 percent growth rate. And there is something else to look at. Because oil is fungible and moves on a world market, and it really doesn't matter in today's world who owns the oil, the guy who bids the highest gets the oil. It all moves on a global marketplace. And since we use one-fourth of the world's oil, our 50-year supply at only 2 percent growth rate will last the world just one-fourth of 50, or 12½ years.

So the coal is there. It is the most readily developed, unconventional fossil fuel energy source, and we need to husband it. But it is dirty. You will pay an environmental penalty if you use it without cleaning it up, or you will pay a big economic penalty if you clean it up.

Let's go back to the original chart we were looking at. And the previous speakers talked about nuclear, and indeed today we produce about 20 percent of our electricity, 8 percent of our total energy from nuclear. We could and maybe should do more. There is no energy source that is without its drawbacks. When you burn any fossil fuel, you release CO_2 into the atmosphere and that produces greenhouse effects, which might very well produce global warming. There are potential drawbacks to nuclear, but so are there drawbacks to not having enough energy for your civilization.

There are three ways in which we can get energy from nuclear materials. One of them is the lightwater reactor, which is the only kind of reactor that we have in our country that uses fissionable uranium, and there is not an inexhaustible amount of fissionable uranium in the world.

And one of the big problems in this whole dialogue is agreement on what the facts are. When I ask how much fissionable uranium remains in the world, and I guess you have to say at current use rates, I get numbers that range from 15 years to 100 years. We desperately need an honest broker to help us agree as to what the facts are so that we can have a meaningful dialogue.

I have thought a lot about this, and perhaps the National Academy of Sciences, which is highly respected and very knowledgeable, would be this honest broker. Because when we sit at the table discussing where we are and where we need to go, you can't have a rational discussion without agreeing on the facts. But nobody disagrees that there is an inexhaustible supply of fissionable uranium. So obviously at some point in a few years, or a few more years with building more nuclear power plants, and China wants to build a lot more nuclear power plants, we will run out of fissionable uranium.

And then we will have to move to the second type of energy released with nuclear fission, and that is the breeder reactor. The only breeder reactors we ever had were those that were used for producing nuclear weapons. France produces about 80 percent, 85 percent of its electricity from nuclears, and they have some breeder reactors. The breeder reactor does what its name implies, it breeds fuel, so you now will have essentially a replaceable and therefore inexhaustible amount of fuel.

But there are problems that go with the breeder reactor. It has waste products that you have to somehow store away for maybe one-quarter of a million years. Now, we have only 5,000 years of recorded history. It is hard for us to imagine one-quarter of a million years. Something that is so hot that I have to store it away somewhere for one-quarter of a million years I think ought to have enough energy in it that we ought to be able to do something productive with that energy. As a matter of fact, the usual nuclear power plant gets only a tiny percentage of all the potential energy out of the nucleus.

So I would like to challenge our engineers to look at a way to make something good out of what is now a big problem when you have breeder reactors, and that is a byproduct that you need to store away for very long time periods.

The second type of nuclear energy release is what is called fusion. And we have a great fusion reactor; it is called our Sun, which is a mediocre star over near one end of the Milky Way. By the way, if you go someplace where the air is not so polluted and you look up at night, you can see across the sky that great Milky Way. It looks like you have taken a brush across the sky. There are just billions and billions of stars out there.

□ 2200

All of the stars are the equivalent of our sun, by the way. Nuclear fusion, power plants, if you will, and we are kind of a mediocre one near one end of the Milky Way.

We invest about $250 million a year in nuclear fusion. I happily support that. I wish there was a technology out there to and a technologist to use more money. I would happily vote for that. But if you think that we are going to solve our energy problems with nuclear fusion, you probably have some confidence you are going to solve your personal economic problems by winning the lottery. The gamble is about the same.

I think there are huge, huge engineering challenges with nuclear fusion. We have been working for many years, and we are always about 20–30 years away from a solution. We have been 20–30 years away from a solution for the last 20–30 years. We may get there. But it is not the kind of thing that you would want to bet the ranch on. By the way, we are home free if we get that. That would be an inexhaustible source of energy, essentially pollution free except for thermal pollution.

I would like to talk about thermal pollution in our power plants. We have had the luxury in this rich country we live in to put our nuclear power plants away from where we live, and the heat energy that comes out of them, we dissipate. If you drive, you see the big cooling towers for the nuclear power plants. What we are doing is we are evaporating drinking water to cool these power plants.

Almost everywhere else in the world, whether it is nuclear or coal, no matter what it is, unless it is hydro, then it is where the water is, but every other power plant is pretty much in the city right where people live, and they use the heat from that for what they call district heating. They pipe it to homes and businesses, and they use it in the wintertime to heat. In the summertime, you can use the heat to cool by the ammonia refrigeration, ammonia cycle refrigeration system, which used to be very popular in this country. But now you have to buy one from Argentina if you want one, for some reason. They have no moving parts and last a very long time. You can get cooling out of heat. So you can both heat and air conditioning with the excess heat from these power plants if you simply sited them nearer where people live.

Once you have used these finite resources, and they are finite, except for the nuclear that we have discussed. The others are finite. They will not last forever, then we will have only the true renewables left. They are such things as solar and wind and geothermal. This is true geothermal.

You may have people talk to you about geothermal and they are talking about connecting your heat pump to the earth or a well. What you are doing with your heat pump in the summertime, your air conditioner is really trying to heat up the outside air, that is how it cools the inside. And in the wintertime, your heat pump is keeping you warm by trying to cool down the outside air.

If you are working against groundwater, and here it is about 56 degrees, groundwater looks very cool in the summertime, and it looks very warm in the wintertime. I remember as a little boy we had a springhouse on our farm, and that is where our food was kept cool. I used to wonder how does that happen.

In the summertime I went into the springhouse and it was so cool. And in the wintertime, it felt so warm. Of course it was essentially the same temperature. But in contrast with the hot summer air it felt cool, and in contrast with the cold winter air it felt warm.

True geothermal is where we are connected to the heat from the molten core of the Earth. If you have been to Iceland, there is not a chimney in all of Iceland because they have geothermal and they get all of their heat sources from that.

Several places in our country we can tap that, and wherever we can we should. It is not really inexhaustible. The molten core of the Earth will not be there forever, but it will be there for millions and millions of years, so from our perspective that is an inexhaustible source of heat so we include it under renewables.

Then we have a number of sources of energy from the oceans. There is huge potential from the oceans. The tides, and by the way, the tides are one of the few energy sources that are not either the direct or indirect result of the sun. All of the fossil fuels that we are burning, gas and oil, and all of these tar, sands and oil shale were all produced by organic material that grew because the sun was shining a very long time ago.

I knew that when I was a little boy for coal because we lived on a farm in western Pennsylvania, and there was a coal mine on our farm. There had been a cave-in and they simply took the mules and the people out an air shaft that had a walkout slope, and so there was still some coal left. There was not enough to open the mine, but we partnered with a miner from the local town but he opened the mine and they drug coal with a pick and a shovel and a wheelbarrow. So we had what was called run-a-mine coal. We had a coal furnace, as did everybody in western Pennsylvania. Some of the lumps were too big to get in the furnace. Leaning against the cellar wall was a sledge hammer. If the lump was too big, you would break it. I remember breaking those lumps of coal and they would break open and there would be the imprint of a fern leaf. I still get a chill when I think about that.

Here I am looking at something that grew who knew how many eons ago. So I knew very well where coal came from, it came from vegetation that had fallen and was overlaid with Earth.

You can see coal in the process of production, by the way, in the bogs of England. It is not yet coal but it is on the way to coal. And if you take it out, it will burn.

The sun produces most of the energy that you can get from the oceans. It produces thermal gradients. It produces the waves. How does it do that, by producing wind. The wind is the result of the differential heating of the Earth, and that therefore is sun driven.

There is one big potential source of energy in the ocean that is not sun generated, and that is the tides. They are generated by the gravitational pull of the Moon, which lifts the whole ocean 2 to 3 feet.

Can you imagine the incredible amount of energy it takes to lift three-fourths of the earth's surface 2 or 3 feet a day. We have tried to get meaningful energy from the tides without a whole lot of success, and it is simply because they are so disperse. There is an old axiom, energy or power to be effective must be concentrated, and the tides are anything but concentrated. They are spread over huge, huge expanses.

We get some meaningful energy from the tides in the fjords where because of funneling effects you may have a 60-foot tide. You let it come in and then you wall it off and let it flow out through a generator when the tide goes out.

There is another potential source of energy from the oceans, it is not really oceans but you find most of it there, and that is gas hydrites. There is more potential energy in the gas hydrites I understand than in all of the fossil fuels in all of the Earth, but we have been singularly unsuccessful in trying to collect those little nodules of gas hydrites and get the energy from them because they are dispersed largely on the ocean bottom over enormous expanses of the ocean. Well, these are all challenges. And one day when energy becomes less and less available from fossil fuels and more and more expensive, some of these other sources will be more exploitable.

And then the agricultural resource, and let me put the next chart up here.

I would like to start on the left-hand side of this because it really shows us where we are and the challenges we face. We are very much like the young couple whose grandparents have died and left them a pretty big inheritance, and so they have established a life-style, pretty lavish life-style where 85 percent of the money they spend comes from their grandparents' inheritance and only 15 percent, some people will say 14, 15 percent comes from their income. They look at how old they are and how much they are spending, gee, it is going to run out before they die, before they retire, as a matter of fact. So they obviously have to do one of two things, or both: They have to make more money or spend less money. That is pretty much where we are with energy.

Three-fourths of all of the energy that we use comes from fossil fuels: Petroleum, natural gas, and coal.

Only 15 percent of it comes from something other than fossil fuels. Eight percent comes from nuclear power, and that is 8 percent of our total energy. Nuclear power represents 20 percent of our electricity. If you don't like nuclear power, imagine when you go home tonight that every fifth business and every fifth home doesn't have any electricity because that's what the picture would be if we didn't have nuclear power. So 8 percent. And this is data from 2000. It is a little different because we have been trying to do something since then.

Seven percent of the energy represents the true renewables, like solar and wood and waste and wind, conventional hydro. Agriculture, here we have alcohol fuel and then the geothermal that we talked about where you are truly tapping into the heat from the molten core of the Earth.

These numbers would have to be a little bigger now, but they would have to be a lot bigger to be relevant because in 2000, solar was 0.07 percent. That is trifling. It has been growing at 30 percent a year so it is several times larger than it was in 2000. But still, it is minuscule compared to the 21 million barrels of oil that we use per day.

And 38 percent of this comes from wood and that's largely the paper and timber industry burning waste product.

Then a very interesting one, waste to energy. A lot of people look at the incredible amount of waste we have and say if we could just burn that waste, we could get a lot of energy from that. That's true.

As you go up into Montgomery County, they have a very nice one, I would be proud to have it beside my church. You don't even know it is a waste to energy power plant. It is a nice looking building and the train or the truck comes in and the waste is all in containers and you don't even see it.

But let me remind you that almost all of this waste is the result of profligate use of fossil fuel energy. What you are really doing when you burn that waste to produce electricity is you are kind of burning secondhand fossil fuels because that's what was used to produce this waste. In an energy deficient world, there will be far, far less waste because waste is a by-product of large energy use, and in an energy-deficient world we would be using nowhere near as much energy.

Wind. Wind is really growing. Our previous hour talked about wind. The wind machines today are huge. You may see the blades for them go down the highway. They may be 60 feet long, as big as an airplane wing. They are huge, and produce megawatts of electricity. They are producing them at about 2.5 cents a kilowatt hour.

By the way, because we did not have the proper incentives in our country, we have now forfeited the manufacture of this product. Almost all I understand of the new big what I think are handsome wind machines are made overseas. Most are made in Denmark.

The cheapest electricity costs several times the 2.5 cents a kilowatt hour, so wind machines are now really competitive with other ways of producing electricity.

There are a lot of siting problems, a lot of nimby kinds of reactions. That is, not in my backyard. My wife says these are really bananas, build absolutely nothing anywhere near anybody, she says is the attitude of many of these people.

You know, pretty is as pretty does, and if your alternative is shivering in the dark in an energy deficient fossil fuel world, that may be what we are coming to, and wind machines may start to look a whole lot better. I know some people who live along the coast would mind wind machines if they couldn't see them, so they are trying to site them out in the ocean beyond the horizon so they won't see the wind machines.

□ 2215

Conventional hydroelectric. You see, that is the biggest sector of these renewables. We have about maxed out on that. We have dammed every river we should have dammed and maybe some we shouldn't. The migratory path of fishes, and I saw a big article the other day about eels, we are now building some ladders so that eels, which are snake-like fish, can get back to their spawning grounds, but there is a huge potential, I understand, maybe as big as that, from something called microhydro. And that is using the water flow and drop in small streams. And there you can use it without the big impacts on the environment that you have when you dam up a big river.

By the way, if you have dammed that river up for water for a downstream city, that will become less and less effective as it gradually fills in with silt, and it will. And by and by, who knows how many years later, there will be little water there because it will be mostly filled with silt that came down from further up in the watershed.

If you are just interested in electricity, it still, when it comes over the dam, falls the same distance. So that silting in won't really effect how much electricity you can produce, but it will affect how much you can vary the height of the reservoir so as to always maintain some reserve for producing the electricity.

I would like to spend a few moments talking about energy from agriculture. There is an awful lot of hype about energy from agriculture. I read the other day, and I don't know why it took us so long to find this, but in 1957, 50 years ago this year, Hyman Rickover, the father of the nuclear submarine, gave a talk to a group of physicians. It is an incredible speech. He was so prophetic. He understood that gas and oil were not forever. That, I think, is obvious.

Maybe it is because I am a scientist, but probably 40 years ago I started asking myself the question, you know, since gas and oil obviously are finite, they are not infinite, they will not last forever, at what point do we need to start being concerned about what is left? Is it a year, 10 years, 100 years, 1,000 years? I didn't know when I first started asking this question. But I knew that at some point in time the world would have to start thinking about, gee, what do we do when gas and oil and coal are gone? Because one day gas and oil and coal will be gone.

So there is a lot of hype about energy from agriculture. But Hyman Rickover, very, very astutely observed that as our population increased, the ground would be more used for producing food than it would be something you burned or fermented. And he also noted, talking about biomass, that biomass might be more valuable returning it to the soil so that you still had soil rather than taking it off to either burn or ferment.

We will get some energy from agriculture, but every bit of corn you use to make ethanol is corn that is not used as a food. We are well fed in this country, many of us more than well fed, but tonight, about 20 percent of the world will go to bed hungry. But as our population continues to increase, there will be less and less opportunity to use agriculture products for energy rather than food.

By the way, there is one way we could free up a lot of agricultural products for energy. If you will eat the corn and the soybeans rather than the pig and the cow that ate the corn and the soybeans, then you could free up a lot of corn for ethanol and soybeans for biodiesel. The animal breeder may brag he has a pig or a chicken that is so efficient that three pounds of corn will make one pound of pig. That is true. But that is three pounds of dry corn and one pound of wet pig; maybe 90 percent dry matter in the corn and for sure 70 percent water in the pig. And you can't eat his bones.

And so on a dry matter to dry matter basis, it takes at least 10 pounds of dry matter in corn to make one pound of dry matter in the pig or the chicken, and probably 20 in the steer. You get very much more efficient conversion of these grains and beans into good food if you use milk.

A cow will today produce 20,000 pounds of milk in a year with a ton of dry matter. She doesn't weigh a ton, but you have a ton of dry matter in her milk for the year, which has very high food value. There is no protein that is as good as milk protein. We determine the quality of protein by feeding young rats. It may not be complimentary that the animal has dietary requirements nearer us than any other, rats, but they do. And they are also omnivorous. And we determine how good their protein is by how fast young rats grow.

If you assign a value of 100 to milk protein, eggs come in at about 96, and the meats on down. And that shouldn't surprise you. God or nature, or whoever you think did it, obviously designed milk to grow young animals. A 100-pound sheep will put a pound each on twin lambs just from her milk. Enormously efficient. And eggs are very efficiently produced compared to producing the chicken that you eat.

So we can free up a lot of these food crops for energy if we will simply eat the food crops rather than processing them through animals.

The next chart shows one of the challenges in producing ethanol. Indeed, there are some scientists who believe that we use more energy in producing ethanol, more fossil fuel energy in producing ethanol than we get out of it. I hope they are wrong. I believe that it can be possible. But even after you have made the ethanol, you still have all of the protein and all of the fat left in the corn, and that is pretty good feed.

Just an observation about what we eat and give to our animals. If you go to the Orient, the main protein source there for people is what is called tofu, and that is soybean protein. In this country, we take the soybean and we express the oil, which is the least valuable nutritionally, and we use the oil and we feed what is left of it to our pigs and chickens. No wonder that they are healthier than many of us.

Here is a little comparison of the energy inputs in producing ethanol and in producing gasoline. Obviously, you expend some energy. You don't get all the energy from the oil in your gas tank. You expend some of that in drilling it, in pumping it, transporting it, refining it and hauling it to the service station, and so forth. So you use 1.23 million Btu's to get 1 million Btu's.

Well, what is the story with corn? Now, you have a lot of free energy with corn. You have the solar energy, the photosynthesis that makes the corn grow. And this is about as good as it is going to get. To get 1 million Btu's of energy out of corn, you are going to have to spend about three-fourths of a million Btus in growing the corn, harvesting it, processing the ethanol, and so forth.

Down at the bottom here is a very interesting pie chart, and it shows something that very few people know, and that is that almost half the energy that goes into producing corn comes from nitrogen fertilizer, which is now made from natural gas. So this is a fossil fuel input. This is all fossil fuel input, by the way.

You just go around this little pie here and you are talking about mining the potash, and mining the phosphate, and mining the lime that makes the soil sweeter so that the nutrients can be absorbed. The diesel fuel in the tractor, the gasoline, the liquid propane gas, the electricity you use is produced by fossil fuels. The natural gas you use for drying your crops, for instance, the custom work, the guy you hire to come.

And then all of the chemicals, something that we rarely, rarely reflect on. Gas and oil are huge feedstocks for a very important petrochemical industry. Most of our insecticides, most of our herbicides and so forth are made from gas and oil. And this is the contribution they make to growing corn. It is really, really quite large there, isn't it?

I have been told that 13 percent of our corn crop would displace 2 percent of our gasoline. But the only fair way to look at the contribution ethanol can make is to grow corn with energy from corn, and you can do that. But if you grow corn with energy from corn, to get a bushel of corn to use here, you have to use three bushels of corn. Remember, the 750,000 Btu inputs to get a million? You need three bushels going in to get one out, which means that it is one to four. You only get a fourth of it out, which means that you are going to have to use 52 percent of your corn crop to displace just 2 percent of our gasoline.

So when you are hearing the euphemistic projections of how much of our gasoline we are going to displace with ethanol, just remember these numbers.

Now, some people are even more enthusiastic about what is called cellulosic ethanol. Cellulose and lignin, particularly cellulose, we can't digest. It is made up of a whole long string of glucose molecules, which is a simple sugar; half of what we call sucrose, which is a double sugar disaccharide. But they are so tightly bound together, we don't have any enzymes in our gut which will release them. And neither does any other animal, by the way.

So, gee, you might say, how do cows, sheep, goats, horses, and guinea pigs make do eating grass and hay? They make do because they have in their gut what are called comincils, animals or little critters that live in there, some of them multi-cellular, some single cells, that have chemicals, enzymes that can split the cellulose into the requisite glucose molecules and then the host simply absorbs those.

We are now able to bioengineer some little organisms that can do that. So now, when you look at the huge piles of beet pulp, look at the corn fields with all the corn fodder out there, people are saying, gee, look how much energy we could get from this agricultural waste. You can get it by burning it, or you can use it by making cellulosic ethanol from it. But, you know, topsoil is topsoil because it has organic material. It gives it tilth. Why does it have to be there? Because without the organic material, the soils can't hold the nutrients and they can't hold the water necessary for growing things. You can't grow plants in stone dust and you can't grow plants in sand. So you have to have organic material there. For a few years, we might be able to mine the organic material and still grow some crops, but there will be diminishing returns. I don't know steady state how much we can take.

Some people are euphemistic about how much we are going to get from sawgrass, prairie grass. They see it growing in huge amounts. But I suspect this year's prairie grass is growing because last year's prairie grass died and is fertilizing it. Now, we certainly can get something from this biomass, from agricultural waste and from growing trees and so forth, but it will not be enormous.

Let me give you some idea of what the challenge is. We use 21 million barrels of oil a day. Each barrel of oil has the energy equivalent of 12 people working all year. Hyman Rickover used data which showed the average family in 1957 used fossil fuel energy resulting in the equivalent of having 33, he said, full-time servants.

□ 2230

If you have some trouble getting your mind around this one barrel of oil and 12 people working all year, and by the way, that is costing you less than $10 per person per year, think how far a gallon of gasoline or diesel fuel, I appreciate the chart from the previous hour which showed how cheap oil was. It costs considerable less than water in the grocery store, by the way. But think how far that gallon of gasoline or diesel fuel carries your car and how long it would take you to pull the car there. And that gives you some idea of the challenge we face.

Another little example: if you are a strong man and work hard all day long, I will get more work out of an electric motor for less than 25 cents' worth of electricity. Now, that may be humbling to recognize that you are worth less than 25 cents a day in terms of fossil fuel energy, but that is the reality.

There are two publications. We have only a few moments remaining. I want to go quickly through some slides here. We have two major studies, one of them is a Corps of Engineers study and these first few slides will be from their study. The second one is the big SAIC study, commonly known as the Hirsch Report. I just want to read quickly some of the things they said. These are paid for by our government. They are out there. You may be asking the question, Gee, why aren't people talking about this and why aren't we doing something about it? Good question.

This is from the Corps of Engineers: the current price of oil is in the 45 to 57 per barrel range and is expected to stay in that range for several years. When they wrote this, by the way, it was about 65. Oil prices may go significantly higher, and some have predicted prices ranging up to $180 a barrel in a few years.

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. 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. And then this quote: In general, all nonrenewable resources follow a natural supply curve, getting more and more till you reach a peak and then falling down the other side. And they are concurring, a careful estimate of all the estimates lead to the conclusion that world oil production may peak within a few short years, after which it will decline. Once peak oil occurs, then the historic patterns of world oil demand and price cycles will cease.

And the last one from this source: Petroleum experts indicate that peaking is either present or imminent; will occur around 2005.

And now some charts from the Hirsch Report. This is very widely publicized. They concluded that we would have unprecedented risk management problems as we face the problem of transitioning from declining quantities of gas and oil and moving to alternatives. The economic, social, and political costs will be unprecedented. And then they state, We cannot conceive of any affordable government-sponsored crash program to accelerate normal replacement schedules. They said we should have started 20 years before peaking. If it is here, we are 20 years too late, aren't we?

And then this quote: The world has never faced a problem like this. There is a third report out there and that is by the Cambridge Energy Research Associates, and they believe that peaking will occur sometime in the future. And they present this little chart. This shows Hubbert's peak here, by the way, and because the actual data points didn't exactly follow his prediction, they are saying that you can't rely on his analysis. The little peak here, by the way, and the next chart will show us, that is from the Alaska oil find. Just a blip and the slide down the other side of Hubbert's peak.

And then in the couple of minutes remaining to us, the last slide we will have a chance to look at here. And this shows several predictions, depending upon whether you think the world will find enormously more oil than we now have found. And I will tell you that most of the experts that I have talked to believe we have found 95 percent of all the oil we will ever find. That is this curve. If you think we are going to double the amount of oil that we have now found, then that is this curve. And the one on top here, and by the way, they say that they don't believe in peaking, but they present this curve which shows peaking. This is unconventional oil.

Make up your own mind how much of that we are going to get, remembering the discussion we had earlier of the difficulty of getting this oil.

Mr. Speaker, we in the world face a huge challenge. I just returned from China. They are talking about post oil. They get it. I wish we did.

LEAVE OF ABSENCE

By unanimous consent, leave of absence was granted to:

Mr. LEVIN (at the request of Mr. HOYER) for today until 1:00 p.m.

Mr. RAMSTAD (at the request of Mr. BOEHNER) for today until 2:00 p.m. on account of attending a funeral.

SPECIAL ORDERS GRANTED

By unanimous consent, permission to address the House, following the legislative program and any Special Orders heretofore entered, was granted to:

(The following Members (at the request of Mr. PALLONE) to revise and extend their remarks and include extraneous material:)

Mr. DEFAZIO, for 5 minutes, today.

Mr. PALLONE, for 5 minutes, today.

Ms. WOOLSEY, for 5 minutes, today.

Mrs. MCCARTHY of New York, for 5 minutes, today.

Mr. MCDERMOTT, for 5 minutes, today.

Ms. NORTON, for 5 minutes, today.

Mr. GEORGE MILLER of California, for 5 minutes, today.

Mr. STUPAK, for 5 minutes, today.

Mr. SHERMAN, for 5 minutes, today.

Mr. SCHIFF, for 5 minutes, today.

Ms. KAPTUR, for 5 minutes, today.

(The following Members (at the request of Mr. KIRK) to revise and extend their remarks and include extraneous material:)

Ms. FOXX, for 5 minutes, today and January 19, 22, 23, 24, and 25.

Mr. GILCHREST, for 5 minutes, today.

Mr. MORAN of Kansas, for 5 minutes, today.

Mr. PENCE, for 5 minutes, today.

Mr. JONES of North Carolina, for 5 minutes, January 22, 23, and 24.

Mr. HULSHOF, for 5 minutes, today.

ADJOURNMENT

Mr. BARTLETT of Maryland. Mr. Speaker, I move that the House do now adjourn.

The motion was agreed to; accordingly (at 10 o'clock and 35 minutes p.m.), the House adjourned until tomorrow, Friday, January 19, 2007, at 10 a.m.

EXECUTIVE COMMUNICATIONS, ETC.

Under clause 8 of rule XII, executive communications were taken from the Speaker's table and referred as follows:

318. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Fluthiacet-methyl; Pesticide Tolerance [EPA-HQ-OPP-2006-0788; FRL-8108-8] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Agriculture.

319. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Zeta-Cypermethrin; Pesticide Tolerance [EPA-HQ-OPP-2006-0769; FRL-8093-6] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Agriculture.

320. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Air Quality Implementation Plans; Pennsylvania; Update to Materials Incorporated by Reference [PA200-4201; FRL-8249-6] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

321. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Amendment to Tier 2 Vehicle Emission Standards and Gasoline Sulfur Requirements: Partial Exemption for U.S. Pacific Island Territories [EPA-HQ-OAR-2006-0363; FRL-8263-4] (RIN: 2060-AN66) received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

322. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Air Quality Implementation Plans; Maryland; PM-10 Test Methods [EPA-R03-OAR-2006-0904; FRL-8264-8] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

323. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Implementation Plans; Revisions to the Nevada State Implementation Plan; Requests for Rescission [EPA-R09-OAR-0590; FRL-8260-1] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

324. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Implementation Plans; Tennessee: Approval of Revisions to the Knox County Portion of the Tennessee State Implementation Plan [EPA-R04-OAR-2004-TN-0004, EPA-R04-OAR-2005-TN-0009, EPA-R04-OAR-2006-0532, 200607/17(a); FRL-8256-6] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

325. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Implementation Plans; Tennessee: Approval of Revisions to the Knox County Portion of the Tennessee State Implementation Plan [EPA-R04-OAR-2006-0577-20062 (a); FRL-8265-4] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.

326. A letter from the Principal Deputy Associate Administrator, Environmental Protection Agency, transmitting the Agency's final rule — Approval and Promulgation of Implementation Plans; Tennessee: Approval of Revisions to the Knox County Portion of the Tennessee State Implementation Plan [EPA-R04-OAR-2005-TN-0009, EPA-R04-OAR-2006-0471, EPA-R04-OAR-2006-0532, 2006014(a); FRL-8265-8] received December 27, 2006, pursuant to 5 U.S.C. 801(a)(1)(A); to the Committee on Energy and Commerce.