now, once that is past the end of this month, let us just go back to the drawing board and write a CAFTA that, number one, we can be proud of; number two, that will lift up workers in those countries and will help invigorate the middle class in this country. It is very possible to do that. It is just we do not have the will to do it.

Ms. SCHAKOWSKY. Mr. Speaker, if I could, it is bad enough I suppose that usually these workers are paid such low wages, but should those workers try to organize themselves into a union to try and stand up for better working conditions and better wages, we know that in those countries that human rights violations for people who want to form a union are rampant; and the problem with CAFTA is that it really does virtually nothing to protect those workers who want to organize.

We hear in CAFTA, ostensibly it requires enforcement of the local labor laws, both that may exist in the country. Of course, those could change, but even then the penalties are very, very weak. Violations of core labor standards cannot be taken to dispute resolution, and the commitment to enforce domestic labor laws is subject to remedies weaker than those available for commercial dispute.

So every time we put the rights of capital, the rights of intellectual property, the rights of the corporations up here and the rights of workers even to stand up for themselves to try and collectively bargain for better conditions or wages, and it is often at peril of their lives that they do that, not just job loss, but we find in many of those countries that it is very dangerous to be a labor organizer. You can find those people dead.

The other thing is we spend a lot of time around here talking about illegal immigration; and, again, if you think about it in human terms, people do not generally want to leave their homeland. They would prefer to stay there, the place where they are born, where their families live, where their ancestors are, where they have roots. Why do they leave those countries to come to the United States, to risk crossing that river, risk crossing that border? It is because they cannot make a living. They cannot provide any kind of a decent life for their family, and they are willing to do anything to do that and so they come here.

If we want to be able to protect our borders and to have good trade policies, then we have to look at things that will help to lift those workers in other countries so that they can prosper in their homelands.

Ms. KAPTUR. Mr. Speaker, if the gentleman would yield, I want to follow on that point because if one looks just at NAFTA and Mexico, and the inability when we were debating that to include provisions for those that were going to be displaced from their farms in Mexico, what is propelling U.S. immigration is NAFTA because every year now we have over 450,000 individuals from Mexico coming over our border, the vast majority illegal.

You say, well, why would they do that? Because they are in desperate circumstances. Desperation propels them, just as the gentlewoman from Illinois (Ms. SCHAKOWSKY) says. Imagine being willing to die going across the desert in Arizona to get here, a place you do not even know, and what is at the root of it?

The root of it is that their land is no longer productive. The big corporate interests down there buy imported corn, and these people were given no way of transitioning. They had a heartless government, and I think because they did, we might see the first massive historic change in Mexico's elections next year. I hope so, and I want to say to the gentleman from Portsmith, Ohio (Mr. STRICKLAND), when he talked about the churches and the synagogues and the temples and the mosques, they are doing some of the most important work in these trade agreements. They are trying to reach out to people, just like you said, and whether it is fair trade coffee or whether it is quilts or whatever they are buying, they are trying to bring it in and pay people a decent price for whatever that product is and to cut out these middle extortionists, I call them, people in the middle that are trading on that squalor and that exploitation.

Also to say that one of the greatest religious leaders I ever met said ultimately God's judgment would demand not just individual morality for us as persons, but in a rich and powerful Nation like America, justice of us as a Nation. So we are judged not just as persons within our own family, but the kind of society and country we create. We will be judged on many levels; and I think these trade agreements are, as you said, immoral because those who are the least among us are hurt the most.

I think of Norma McFadden from Dixon Ticonderoga in Sandusky, Ohio, who worked there her whole life and was about my age and then was told you get a pink slip, even though the company was profitable, and moved to Mexico. What happened to Norma? What happened to Norma was she could not afford health benefits because under the Federal program, COBRA, it costs about $800 a month. Well, she lost her job. She could not afford the $800 for COBRA. So at 55, 58 years of age, she went back to school to become a phlebotomist to learn how to take blood, and she had to drive to work in her old ramshackle car to try to go to school and ultimately tried to get a job at a hospital as a receptionist and just trying to tread water there in the years when really she should have some peace of mind because she has been a working woman her whole life, she has raised her family.

So, to me, these trade agreements are some of the most anti-life measures that I have ever seen. They hurt people all over our world, surely those in our country who just do not have another leg to stand on; and I think God will judge America very harshly for what we have done because we are in the power position in negotiating these agreements.

Mr. BROWN of Ohio. Mr. Speaker, I thank the gentlewoman from Ohio (Ms. KAPTUR), the gentleman from Ohio (Mr. STRICKLAND), the gentlewoman from Illinois (Ms. SCHAKOWSKY), the gentleman from Missouri (Mr. CARNAHAN), and the gentleman from Ohio (Mr. KUCINICH) earlier. I appreciate that human spiritual component.

I would close in an optimistic tone. The gentlewoman from Illinois (Ms. SCHAKOWSKY) talked about what happens with labor unions and human rights in Central America and in South America and in Mexico. Just hold up for a model what happened in Central and Eastern Europe in the last 20 years. The thrust of their equal rights movement came out of the labor movement, and flowing out of that labor movement came a much better way of life, came freedom, better economic security, more wealth for workers, all that we should be striving for. That is why labor standards for these workers in these trade agreements is so important.

As the CAFTA countdown comes, we are down to the last 16 days, it is pretty clear NAFTA will be dead on arrival. It is time at the end of May when we come back in June to start with a new trade agreement that will lift workers up and make us both spiritually and intellectually and in every other way proud of what we do.

ENERGY

The SPEAKER pro tempore (Mr. JINDAL). Under the Speaker's announced policy of January 4, 2005, the gentleman from Michigan (Mr. EHLERS) is recognized for 60 minutes.

Mr. EHLERS. Mr. Speaker, I am pleased to rise tonight with several of my colleagues to discuss an issue of great importance to our Nation, and I know that everyone that gets up here starts the same way, but this is a particularly important issue, one that the three of us wish to discuss as scientists, or those who have a great interest in science.

Tonight's topic is going to be energy. You have heard a lot about energy recently, worried about the gas prices, worried about the energy policy bill that we have worked on in the House and the Senate is now studying. Energy is extremely important, but what is most important to me when we are talking about energy or any other issue is to talk about the long-term effects because that is what the people hire us for. They elect us to come here and discuss and debate the future of this Nation, and it is very easy to forget that because we are always caught up in the instantaneous things we do, the stuff we have to get done today; but the people of this land, struggling

every day to make a living, keep ends together, do not have the time to do the long-range thinking.

Corporate leaders are bound by their requirement to produce profits every quarter, to get the stock price up. It is up to us to really think about where this Nation is going and what is really important and what is likely to happen to it.

So I wish to approach this topic this evening to talk about our energy future, where are we now, what is energy like, what is going to happen in the future; and between the three of us discussing this this evening, I hope that we can enlighten our colleagues and others who are interested in the topic.

Let me begin by an introductory way just talking about energy and the nature of energy.

I happen to be a scientist, a physicist to be more precise; and I have been involved in energy studies for some 30 years, but also because of my background in physics, I have learned a lot about energy, and I would like to tap some of that knowledge to talk about some of the issues and point out some of the characteristics of energy.

First of all, energy is unique. Unique means there is nothing else like it. It is unique in several ways. Energy is our most basic natural resource.

□ 2100

For one simple reason: Without it, we cannot use our other natural resources.

Now, let me give an example of that and to prove my point that energy is our most basic natural resource. If you would like to build something out of iron, suppose it is a car or a can or whatever, the first thing you have to do is dig the iron ore out of the ground. That takes energy. Then you have to transport the ore to the smelting plant and recover the iron out of the ore. Transportation takes energy. Smelting it takes energy. When you are finished with that, you transport it the rolling mill. That takes energy. And you roll it out into sheet steel so it is easier to work with. That takes energy. Then you transport it to the factory. That takes energy. Finally, you fabricate a car or something else out of it, and that takes a lot of energy. Finally, you transport the finished product to the consumer, which once again takes energy.

Notice that every step of the way you were using energy in order to use other natural resources. I could have picked any other natural resource, and the same thing would be true. So energy is our most basic natural resource. You must always remember that. But secondly, and perhaps even more important, energy is a non-recyclable resource. Once you use it, it is gone. Now, if we use up our iron, we could go mine our landfills. We can recover scrap iron, as we do already to a great extent, and we can recycle it over and over and over. There is only so much iron on this planet, but we can keep using it over and over and over, and we are not likely to run out. Its cost may go up, but it is still there.

But when you use energy, it is gone. When you fill your tank with gasoline and you drive it for a week and the tank is empty, the energy is all gone. It is used up. Where does it go? We know energy is conserved, but it can change form. All the energy from the petroleum you put in your car, from the gasoline you use, gets consumed and turned into heat energy, largely unusable heat energy. And eventually, that gets radiated out into space, and it is gone for us forever.

So these two important features define a great deal about energy and how we should treat it and how we should handle it. Finally, because of this, the price of energy affects our economy more than the price of almost any other resource, simply because when the price of energy goes up, that price gets added on to every step of the manufacturing process which I mentioned.

Let me mention some other characteristics of energy. Energy is intangible to most people. To me, as a scientist, it is very tangible. I have worked with energy so long I can almost touch it, feel it, taste it, et cetera. But to the average person, you cannot touch it. You cannot see it, unless it is light energy. You cannot feel it, unless it is heat energy. You cannot smell it, and you cannot taste it. So energy is intangible. To most people, the only tangible aspect of energy is the price at the gas pump or the utility bill at the end of the month.

Because energy is intangible, people tend not to understand it. They do not know how to use it properly. I have a saying I often use, and I even have a tie to match the color I am talking about, I wish energy were purple. Because if energy were purple and people could see it, their behavior would change. When they drive home from the store or from the church and drive up to their house in the middle of winter and see a purple haze oozing through the walls because of poor insulation, or purple rivulets around the windows or doors because they are leaking heat, they would say, Man, that is terrible; I have to insulate this house better. I have to seal up the windows and doors more. Because they do not see it, it is not purple so they cannot see it, they are not aware of this.

If you were driving down the highway and a little Toyota Prius or some other hybrid car goes by, something like the gentleman from Maryland (Mr. BARTLETT) drives, and he may discuss that a little later this evening, and this little Prius goes by, and there is just a little purple around it, because it does not use much energy; but then a Hummer or a large SUV goes by, and there is a purple cloud around it, if people could see it they would say, Hey, I am going to get a Prius or some other hybrid car and use less energy. So I wish energy was purple so it would be tangible to everyone. I think behaviors would change very quickly.

To show the importance of energy, I would like to point out that energy affects civilization in a very direct way because energy represents the ability to do work. That, in fact, is the definition of work in physics. Energy represents the ability to do work.

With the first use of nonhuman energy, in other words using animals to plow the fields and so forth, we had the agricultural revolution beginning. We talk about these big revolutions in the human history, and the agricultural revolution is a large one. There is no contention about that. But the agriculture revolution occurred only after we started using nonhuman energy, because people were not strong enough to really do a good job of pulling plows. Before they had plows that they could pull, people tried agriculture, and it never really succeeded until they discovered they could domesticate oxen or other animals and have them do their work, and then the agriculture revolution succeeded.

The next big step was again related to energy. You have heard of the industrial revolution, where we began using industry to manufacture things and to replace human labor. What did we use? Fossil fuels. Coal first and then oil and eventually natural gas. So the first use of nonanimal energy led to the industrial revolution. Once again, this indicates how important energy is to life on this planet and to civilization and to our economy.

I have drawn here on this chart a model for responsible energy use, trying to relate it to something that everyone understands. When you talk about your money, you go out and get a job because you need to eat, and you would like to have a house and a car. So you get a job, and you earn money. That is income. And most people in this country have to live within their income. That is what everyone aspires to. Sometimes, there are special needs, and you dip into your savings. And some are fortunate enough to inherit some money. So that is the model of individual use of money.

Now, you can look at energy the same way. If you look at the income of energy on our planet, most of it comes from solar energy. We talk a lot about using biomass. That is energy from the sun captured by plants, and we can try to retrieve the solar energy from that. Wind energy. Lots of efforts to build windmills and use wind energy. Once again, that energy comes from the sun because the sun differentially heats the atmosphere and that causes the wind to blow. How about hydropower? Huge dams generating lots of electricity for us. Once again, that is solar energy, because the sun evaporates the water off the oceans and the lakes, gets into the clouds and comes down as rain, collects behind the dams, and we use that energy. Waves are also related to solar energy, because that powers the wind, which generates the waves, and people have tried to extract that energy.

The only one on this list that is income energy but not from the sun is

from the moon, and that is the tidal energy. And efforts have been made to tap that, but it is pretty tough to do and you do not get a lot of energy out of it.

What about the savings? Our savings account are all the fossil fuels; coal, oil and natural gas. Those are stored solar energy. That comes from plants which grew many, many, many, many years ago. Those plants eventually got covered up and over the years decayed and turned into coal, petroleum, natural gas.

Then there is wood, which is also a short-term savings account. Again, it is plant. It really could go up in biomass here, but trees live a long time, so I put it down here in our savings account because, normally, we do not use all that energy in our lifetime.

Finally, our inheritance, that is energy we inherited with this planet. Our universe and our planet were so beautifully created, and there are energy sources within the planet. There may be more than I have listed, but certainly geothermal energy. Heat energy within the earth can be used to drive power plants and already is in certain parts of California and other parts of the world. And nuclear energy. Nuclear energy is so long term, and it is basically there from the creation of the earth, so nuclear energy I would also classify as an inheritance.

Now, I would propose that when we are using energy, we should treat it the same way we do our money; try to live within our income. In other words, try to use as much as we can of the solar energy, lunar energy and so forth. Recognize we have to dip into our savings account, and so we can use the fossil fuels and wood for that, but not to the extent we are using it now so that we use it all up, unless we use that to develop new energy resources for our children and grandchildren.

And, finally, the inheritance. That is a long-term thing, but we do not want to depend totally on it. But certainly, that is there and that is a very promising thing to pursue.

Finally, I hope as a result of the discussion we have tonight that all of us in this Congress and all the people of this country will come to appreciate energy. It is my hope that a better understanding of energy will lead to a wiser use of it by our citizens. And so that is the theme of this hour's discussion we are going to have tonight.

Mr. Speaker, I have been joined by several colleagues, and next I would like to yield to my colleague, the gentleman from Maryland (Mr. GILCHREST).

Mr. GILCHREST. I thank the gentleman from Michigan for yielding to me, Mr. Speaker, and I want to thank the gentleman from Michigan for the fascinating discussion mixed with science, history and a little poetry there, I think. Mr. Speaker, I hope many of our constituents across the country are listening to this most important topic.

My colleague, the gentleman from Michigan (Mr. EHLERS), began to speak about energy as not something that you can see or touch, and very few people think about that or think about where energy comes from. It comes from that fuel tank that you lift to fill your car. It comes from someone delivering it to your house. But I would suspect that many Americans and many of our colleagues here in the house feel that energy is a resource that will last forever.

I would like to pose a question tonight to follow on with what my colleague from Michigan was saying, and that is: Is energy infinite? Is energy a bottomless well? And if we look at the bottom of the bottomless well, what do we see?

If we are to have a cohesive energy policy in this country and in this world, in fact, we need to know what that is at the bottomless well, because I happen to think there is no bottom to the resource of energy. But we have to know what that is. What is that resource? What energy source can we rely upon for the unforeseeable future, for generations to come?

The modern world right now is dependent, the industrialized world and the new industrializing world are enormously dependent on an energy source known as fossil fuel. That is coal, natural gas and oil. We also know that the demand is increasing as the supply is diminishing, dramatically. The U.S. oil reserves peaked in 1970.

What is at the bottom of the bottomless well? I think it is initiative. It is ingenuity. It is intellect, and it is logic. Oil, or natural gas, is not at the bottomless well. Oil or natural gas or fossil fuel are finite, and they will not last forever. So we are in a transition period, because the demand is increasing dramatically, and the supply continues to decrease.

□ 2115

The gentleman from Michigan gave us a history lesson about transitions from one energy source to another over a long period of time and showed how our cultures, our industry, our economy, and our cultures have changed. We know that coal in this country some time ago replaced wood and actually saved the forests. Coal was actually more efficient and better for burning or for heating in those earlier years because we stopped burning our forests. Our forests create habitat for wildlife; it is an environmental issue. So coal replaced wood. Oil supplemented coal and oil is more efficient than coal and it is actually cleaner burning. Natural gas supplemented oil. Natural gas is cleaner than oil.

If we looked at it a little bit closer from a chemist's perspective, we would show that there is more hydrogen in coal than there is in wood. There is more hydrogen in oil than in coal. There is more hydrogen in natural gas than there is in oil. So we are moving up the ladder of a better understanding of what sources of energy are important. But all of them are finite. And as our demand increases, our supply diminishes, and we need to begin to rethink our energy sources.

In 1910 if we look at BTUs, British thermal units, if you buy a heater of almost any sort, it will have the number of BTUs that it puts out, the energy output. If we are to measure BTUs from the perspective of how many BTUs the United States uses, what is our energy output, it is measured in quadrillion. If we looked in the year 1910 as an example of BTUs, the United States burned 7 quadrillion BTUs. That is a 1 with 15 zeros. Seven quadrillion BTUs in 1910. If we looked at 1950, we burned 35 quadrillion BTUs. If we looked in the year 2005, it is up to 100 quadrillion BTUs.

The demand is increasing exponentially. In 1970, the year we peaked in our oil, we produced, the United States, 11 million barrels of oil a day. In 2004, we produced 5 million barrels a day. In 2005, we burn roughly 20 million barrels a day of oil. We import about two-thirds of our oil, and that will continue actually to worsen, and we have about 3 percent of the world's oil reserves, or less, and our demand is increasing while our supply is diminishing.

We are actually beginning to see the end of cheap oil in the United States. And burning this resource, burning oil, is not the best use of that resource. We use it, as the gentleman from Michigan said, for a whole range of things, for heating our homes, for air conditioning, for airplanes, for electric lights, for clothing, much of the clothing that we wear, for plastics, for fertilizers, for modern agriculture, for asphalt to maintain our roads. Can you imagine the interstate highway system if we did not have oil to make the asphalt to maintain those many millions of miles? Surgical devices, hip replacement, national defense, all of these things come from oil. It is an integral part of our economy.

Should we really be burning it as fast as we can, as if oil were at the bottom of the bottomless well? Are there other better uses for burning oil? There are. Can we improve our resources here in the United States with something other than fossil fuel? If we continue to rely on fossil fuel, we will never be energy independent and our security will be reduced because most of the oil we import right now comes from areas of the world that are not very stable.

We should begin to seriously think about three things and think of these three things in the way that we use our initiative, our ingenuity, and our intellect to understand what lies at the bottom of the bottomless well. The first thing is fuel efficiency. That is one of the first things we can actually do, tangible things we can do. We have the technology right now to double fuel efficiency. We should start immediately, because it takes about a decade before

you see any results. We could save billions of dollars, reduce our trade deficit, save oil supplies so they last longer. The American Petroleum Institute estimates that we have 25 years of oil left with present demand. That is not with any increase in demand. Is demand going down? Will we burn less than 100 quadrillion BTUs? I do not think so. What will we do about importing the millions of barrels of oil every day? So doubling our efficiency with oil and natural gas will spread these supplies longer and offer us that transition period between a new fuel economy that we desperately need.

The second thing are alternative fuels. The gentleman from Michigan (Mr. EHLERS) and I know the gentleman from Maryland (Mr. BARTLETT) will mention these. There is solar. It is a small piece, but it is a piece. There is wind. It is significant, but it is a small piece of the pie. There are biofuels, a whole range of biofuels from corn to soybeans to poplar trees, to certain grasses, to a range of things that we have already mentioned here tonight; but they are a small piece.

There is hydropower. There is hydrogen which does offer us some hope. It is not a fuel. You can produce it from solar, from wind, from nuclear, from coal. What we have here is a membrane; it excites the molecules and you produce electricity without combustion. But we do not have the technology to mass produce hydrogen to take the place of oil. There is methane from landfills and livestock. There is nuclear power, which is cleaner. The storage of fuel rods is difficult and also, even though it is nuclear, it is a finite source.

We have to start now to make the transition to a new energy source smooth and not disruptive. We must understand the dynamics of this from an economic standpoint, a geopolitical perspective, and cultural life-style.

The third thing is life-style. Our lives, our culture right now, dependent on fossil fuel, our lives are filled with things, things and more things. Look around your home. Where do these things come from? What are they made of? And how do they get delivered to us? The world is dependent on fossil fuel, mainly oil, to make those things, transport those things, and bring them to your home. We import them from all over the world. Oil is related to every aspect of production, distribution, marketing, and consumption of the products you get from megaretailers like Wal-Mart and Sears to McDonald's and Burger King. Our culture.

What will replace oil to keep this kind of economy ever expanding? We talk all the time about a growing economy. How will it expand without oil? We should start talking in terms of a dynamic, sustainable economy without oil. Without oil, our life-styles, in conclusion, our communities, are likely to be smaller and more compact. Our farms are likely to be smaller and more diverse. There will be fewer expanding suburbs wholly dependent upon the automobile. Solar, wind, biofuels can accommodate smaller communities. Nuclear at least for the time will be more significant.

But if we use what is at the bottom of the bottomless well, ingenuity, initiative and intellect, we will have cleaner energy sources, more jobs, drastically reduced trade deficits, more of our own goods will be produced here, a stable economy, more security.

What does the future hold for us? Look deeply at what is or should be at the bottom of the bottomless well. We need the time to transition to this new economy.

Mr. EHLERS. I thank the gentleman from Maryland for his perceptive comments and his poetic, almost philosophical, statements. I appreciate that.

I would just like to add one quick note. When you refer to photovoltaics, I just read an article a week or two ago on this. It is just astounding to me how fast the field has developed in the last few years. Let me just give one quote: We expect that by 2015, photovoltaics will be producing electricity at the cost of 6 cents per kilowatt hour. That is generally less than people are paying for their electricity at their home. And there are no transition costs because you can keep the photovoltaic unit right in your home generating electricity for your home. A friend of mine has built a house which is totally independent of outside energy using photovoltaics and other things. He lives 5 miles from the nearest power line. It works beautifully.

But the very interesting thing is that the prediction is that half of new U.S. electricity generation by 2025 will be produced by photovoltaics, replacing a lot of power plants. I was pleased when I read this. I thought, this fellow really knows what he is talking about. I got to the end and looked at the name. It is Mr. Al Compaan, professor at the University of Toledo and a former student of mine. I did not realize until I reached the end that he was one of my students.

We have approximately 30 minutes, and I have three more speakers so if each of them could limit themselves to 10 minutes or less, I would appreciate it. Next I am pleased to recognize the gentleman from South Carolina (Mr. INGLIS) who was with the Congress for 6 years, term-limited himself, very honorably, and has now returned to us having fulfilled that commitment.

Mr. INGLIS of South Carolina. I thank the gentleman for yielding. I am excited about the work that the gentleman from Michigan (Mr. EHLERS) is doing on the Science Committee and for the innovations that I think that we can together bring about and can encourage from here in the Congress. I am happy to be part of this Special Order to talk about what could be part of our future.

In particular, the aspect that I want to focus on is cars and to have us think about what cars could be in the future. We are bound now by burning petroleum in our cars. We are bound to lethal accidents where people traveling at a high rate of speed end up being killed because cars crash together, blowouts on tires or whatever cause them to have crashes.

What I am excited about is imagining a completely different future, one that has smart cars, has fuels of the future; smart cars that know their position relative to other cars on the road by sensors and by automatic braking systems that take over for the driver, that make it so that a computer is actually driving the car. That for many people sounds like science fiction, but it really is not that far away.

I think it is very interesting that Bill Gates was here recently and spoke with members of the Intellectual Property Caucus and opined that it is not a question of if; it is a question of when we get smart cars. He said in the future, there will be no accidents. Of course, it might not be wise to bet against Bill Gates when it comes to technology issues. While we were waiting, a colleague of ours pointed out that if you had invested $10,000 in a company called Microsoft in 1980, it would be worth $25 million today. So it is not a good idea to bet against Bill Gates when it comes to technology.

What we have, I think, is the opportunity to dream that big, to think of a car totally differently, that it could run itself, that you get in it and it is not so much a steering wheel as it is a computer screen. Unless we think this is far away, think of the blue screen tracker system that is right now deployed in Iraq on the vehicles that we have got over there and so that our men and women know where they are, where their unit is, relative to other units. That is updated every few seconds. The technology, in other words, is not far away. It is on the ground right now in the blue screen tracker system, and it is not far away, in my opinion, for the car.

If you think about what that means, it means compression on the highways. It means that you do not have to have the spacing that we have now, where cars in order to be safe should be driving a fair distance from each other at 60 or 70 miles an hour. As it is, we have got to have a lot of asphalt on the ground to accommodate that many cars traveling at that rate of speed. But if they are smart cars, they can be within relatively few feet of each other, traveling at significant speeds but knowing where one is relative to the other.

That seems like science fiction, but consider this: a number of auto manufacturers, including BMW which makes X5s and Z4s in Spartanburg, South Carolina, are working on braking systems that actually take over the braking decision for the driver. BMW will release a car very soon that does just that. It has a braking system that decides for you when it should apply the brake and keeps you from hitting something.

So if you think about that, the breakthroughs that we are going to get in cars, the compression on the highways, braking systems that make those decisions for you, the ability to get in a car, program it to go somewhere, say from here to Baltimore, take your hands off the wheel, read the newspaper, the productivity gains in the economy are very exciting. There are some very exciting things there now. The key to that is a new energy system, too, one that hopefully will emit only water as you travel, say, from here to Baltimore. That is what the hydrogen economy could promise for us. That is why I am very excited about producing that hydrogen and figuring out how to store it and distribute it. Those are, of course, as I understand it, the three big challenges, producing it, storing it, and distributing it.

Producing it, as one of our colleagues just mentioned, could be in various ways.

□ 2130

Perhaps by concentrating enough energy from the sun, sunlight into a spot to reach temperatures to crack water. And I heard the gentleman from Michigan's (Mr. EHLERS) Special Order a week or so ago about nuclear, and we seem to be of the same opinion that nuclear seems to be one of the more promising ways at this point to crack water. A reactor built for that purpose cannot only generate electricity but can also generate the heat necessary to crack the water. And the beauty, of course, of that is, rather than cracking natural gas, which produces $C0_2$, cracking water would create no $C0_2$, and we would have this wonderful operation that creates electricity plus heat, cracks water, creates hydrogen, and we have got a stable source of fuel.

So production is crucial in envisioning this future that I am talking about here. Second is the ability to store it, to store this hydrogen. A lot of issues there about whether to try to store it in a gaseous state or whether to cool it and try to get it to a liquid state or whether to have some breakthroughs with metal hydrides and determine a way to store it in a solid state. Those are some areas that we need work on, and the gentleman from Michigan can add to that, I think.

And then the third area where we need breakthroughs is how to distribute it, how to set up either pipelines or some other system of distributing this fuel. If we can crack those things, get at producing, storing, and distributing hydrogen, I believe that we are going to be there, not forever away. One of our colleagues who is not so inclined to believe that this is all going to happen once told me, ''Yes, that will work maybe for your grandchildren.'' Well, I think this is going to be here before my grandchildren, and it had better be because, as we have been hearing tonight, we are running out of this stuff called petroleum, and we have got a lot better things to do than burn it. We can make pharmaceuticals. We can make plastics. We can do a lot better things.

Mr. Speaker, I thank the gentleman for giving me the opportunity to share these dreams of the future that may seem like some watching dreamers, but that is how we got to the moon. That is how we get breakthroughs. We have got to be about it and here in the Congress fund it, fund good research on these things, spend good money to create these breakthroughs.

Mr. Speaker, I thank the gentleman for yielding to me.

Mr. EHLERS. Mr. Speaker, reclaiming my time, I thank the gentleman for his comments. And I particularly would like to emphasize a couple of things. First of all, many people tend to assume hydrogen is a new source of energy. It is not a source of energy because free hydrogen does not occur in nature. We have to produce it. And highlighting the needs, we have to develop means of production and storage and distribution, which includes transportation to the gas stations. It is going to be a real revolution. I would expect, by 2020, we will see a substantial number of those vehicles on the road. It is going to take a lot of hard work, but it will be worth it because they will be essentially pollution free, and if we produce the hydrogen using nuclear energy or solar energy, something other than petroleum, we will also be contributing to a cleaner atmosphere and get rid of the greenhouse gasses.

So I thank the gentleman very much for his contribution, and I am delighted to have him on the Committee on Science with me.

Mr. Speaker, next I yield to the gentleman from Tennessee (Mr. WAMP) who has Oakridge National Laboratories within his district and is very interested in science and particularly in energy, which is natural because the Oakridge Laboratories is a Department of Energy facility. So I am very anxious to hear what he has to add to the discussion this evening.

Mr. WAMP. Mr. Speaker, I thank the gentleman from Michigan (Mr. EHLERS) for yielding to me.

Let me say how encouraged I am that five senior Republicans would come together tonight to share different perspectives on the need to secure our energy sources in this country and to help bring the American people along to some of the reforms that are necessary, I think, to secure our future in the world and to create more opportunity. I believe that we have done a lot of good things on this side of the aisle, but I think that we have a whole lot left to be done. And before this energy bill gets back from conference, I think we all need to advocate for quite a few changes.

Let me say that energy and economic development are hand in hand. The gentleman from South Carolina invoked the name of Bill Gates. I would submit that the reason that we balanced the budget a few years ago for a few years in a row was not because we cut spending. We did hold the line on spending for like 3 consecutive years and kept the growth of spending below inflation. But it was because we actually led the world in a particular area of our export economy and information technology and we created such a robust U.S. economy that revenues surpassed expenses, and we balanced the budget. And I would challenge the country that the one great area that we can do that again, as we look over the next 10 to 15 years, is in what I call ''entech,'' energy technologies. Because there are so many energy needs around the world as the population explodes, as third-world countries become industrialized, as people are more mobile, and this global economy that we all live and operate in is increasing the demand for energy, the whole world is looking to us for leadership. And it is an export potential in manufacturing that could lead to the most robust U.S. economy that could actually increase revenues so greatly, because we are so productive, and we are solving the world problems. We could balance the budget again. I do not believe, given today's needs, we can cut spending enough to balance the budget because of homeland security, because of entitlement spending. As a matter of fact, if we eliminate all of the nondefense discretionary funding, we still would have a deficit in this current fiscal year. So we have got to grow this economy, and energy technologies are the way to do it.

Energy, as we have heard already, is a source of many of our problems. But I have get got to tell my colleagues, energy is also the source of the solutions to a lot of our problems, and I am looking forward to the development of technologies. And when we look at this continuum, I love the combination of history and knowledge on energy, but think about the next 100 years and think back on the last 100 years. Man has only been flying a little more than 100 years. That ought to blow people's minds that, in less than 100 years, we can go from Kitty Hawk to people routinely being catapulted into space with a hydrogen system, catapult them into space. They stay out there for a period of time. They reenter the earth's atmosphere in a big ball of fire, and then they safely land and walk away. And except for two great tragedies with Challenger and Columbia, this became routine in less than 100 years. Where are we going to be with technology in the next 100 years? Children ought to look forward to their future. The Jetsons, which was a cartoon we watched, could very well be a reality within the next few decades.

Transportation, though, has to be at the forefront of the energy revolution in this country because two-thirds of the petroleum is used in the transportation sector, and as the gentleman

from South Carolina so well articulated, we have got to look for solutions. I am encouraged by the development of hybrid vehicles. It is the bridge to the hydrogen economy as it develops, and right now, there are more and more automotive systems, cars and light trucks, that are moving to hybrid technologies, both foreign and domestic. And next year, the American consumer will have a host of options.

One of the things that I regretted about the energy bill, and I think several of our colleagues here on our side did not vote for the House version, and I believe we will be able to vote for the conference report when it comes back soon, because the House version did not include the tax incentives to stimulate renewables, alternative fuels, did not extend the tax credit for these hybrid vehicles. And, frankly, we have got people waiting in line, and we need to incentivize more of that so that the manufacturers will be encouraged to make them and consumers will be encouraged to buy them, and we did not do enough in that bill. As a matter of fact, here is what folks need to know, because I have met with President Bush recently and listened to him on this issue: When he sent his proposal over here, 72 percent of the tax incentives in his energy plan were for renewables and energy alternatives, and he really wanted to rachet this up. But, by the time the House got through with it, they had lowered that 72 percent to 6 percent and replaced a lot of the renewables and alternative energy sources with oil and gas. And when they asked the President what he thought about that he said, You do not need to incentivize oil and gas; $2.35 a gallon will incentivize oil and gas. They have got incentives. It is called the marketplace. We need to incentivize the alternatives to oil and gas.

And that is really what we are excited about here, and I believe, when the Senate finishes its work, brings this back, the Republicans in Congress and quite a few good Democrats will come together and pass an energy bill that really moves us towards these alternatives.

Let me tell my colleagues that I look to the private sector to see what they are doing because there is some division at DOE as to whether or not hydrogen is safe and if hydrogen is the solution, and there are still some question marks behind it. But GM and Shell, they do not just throw their money away. They are interested in the bottom line. And they now have 40 hydrogen fuel cell vehicles on the road, a permanent hydrogen station in New York City, a permanent hydrogen station here in Washington, D.C., to demonstrate what can be done.

The challenge, we have heard some of the challenges; another challenge is cost. These units cost $400,000 each. We have got to find ways to bring that cost down to a $40,000 or $50,000 each so that it is cost-effective for the American consumers to jump across this bridge to the hydrogen economy.

I have said that I believe our tax code is the best way to encourage and incentivize manufacturers and consumers to move towards these new sources of energy. Our energy independence, though, is a homeland security issue. I co-chair the Renewable Energy Caucus here in the House, and in the last Congress, we got over half the Members. It is very bipartisan; about 60 percent Democrats, 40 percent Republicans. Many of my colleagues here, I think all of them are members of it. It is so important that we do these things, but I also serve on the Homeland Security Subcommittee of the Committee on Appropriations. Our energy security is a top homeland security issue. As a matter of fact, former national security advisers all came together last month and signed a letter to the President of the United States saying that energy security is a crisis and that it is a national security issue and that we need to address it with the highest level of priority. And there are several crises floating around. We are spending a lot of time talking about them. In my view, this energy issue is right at the end of our nose in terms of a crisis. We have got to mobilize quickly so that we can secure our independence. I do not want to be reliant on the Middle East for petroleum for two-thirds of our transportation needs. And the sooner we act, the sooner we are going to be stable and secure. It is a very important national security and homeland security issue.

We talk about natural gas. The prices have spiked so quickly that now we look at photovoltaics. We look at solar panels for home construction, and because of the rise in natural gas prices, they become cost-effective to put them on their house early. They make solar energy panels in Memphis, Tennessee. Sharp Solar does. And in a lot of places that are cold in the winter, now where natural gas has gone to $7, I think, we can actually put in our building materials these energy-efficient technologies. Go to the National Renewable Energy Lab in Colorado and see the breakthroughs. One will be stunned as to how quickly, as the gentleman from Michigan (Mr. EHLERS) has said, these things are advancing. A host of things. Wind power, we are building more and more windmills in the Tennessee Valley. TVA has the green power switch option. More and more consumers are signing up for that. Pay a little more but know that they have got totally renewable energy coming into their home. It is a popular thing. And, frankly, Republicans leading with a national energy policy for the first time since the late 1970s are doing the right thing for the environment.

But that brings me to a problem we have, and that is in the electricity sector, the cleanest, most efficient electricity in this country is nuclear. In France, these people are very environmentally sensitive. They actually get it, and over 70 percent of the electricity in France is provided by nuclear, but they do prototype their design. They eliminate the margin of error, and they do the same thing over and over again. We need to do that here, and we need to go back into the nuclear business. We have the waste stream problems worked out with Yucca Mountain. We need to be bold enough to say, if we are going to secure our energy sources, and the main thing is there is absolutely no emissions with nuclear. We have clean air. We could actually participate in Kyoto if we would replace fossil with nuclear, and we are smart enough to do it. Dadgum, if the French are smart enough to do it, then we are smart enough to do it.

The House Republicans have a strong energy plan. By the time we finish, we are going to do extremely well. We have got several deliverables from renewable energy and energy efficiency, moving to the hydrogen economy, making sure that our electricity grid is reliable, expanding nuclear power and cleaning up the coal technologies in this country. I am proud to serve with these men and advocate for energy security. I believe we are going to actually send that bill to the President and do the right thing, grow the economy and hopefully ultimately have revenues pass expenses again.

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Mr. EHLERS. Mr. Speaker, reclaiming my time, I thank the gentleman for his comments, and I appreciate his words about the Jetsons. Both previous speakers mentioned we have to be smart with the smart cars of the future. I would say if we are not smart, we may end up like the Flintstones, instead of the Jetsons. So it is very important for us to do the long-term planning we need to in this body.

Also the gentleman mentioned the document from the Energy Future Coalition, which I also have. National security is a very, very important part of this discussion, and it really irritates me that we are financing our foes in the Middle East by sending all this money over there which they are diverting into instruments of war against us.

With that, I am pleased to recognize our final speaker of the day, another scientist, the gentleman from Maryland (Mr. BARTLETT), who is an expert on what is called ''peak oil.'' In other words, we talked about the finiteness of the oil and natural gas supplies. The gentleman from Maryland (Mr. BARTLETT) is the expert, and he will explain that to us.

Mr. BARTLETT. Mr. Speaker, I really want to thank the gentleman for organizing this hour this evening.

The gentleman from Michigan (Mr. EHLERS) mentioned the energy future, and I have a chart here which looks at the past. If you understand how we have gotten here, why, you may be able to see the future a little better.

The gentleman mentioned the wood, and that is the brown line way down here. Then the gentleman mentioned

coal. We transitioned, and the gentleman from Maryland (Mr. GILCHREST) mentioned that also. We transitioned to coal. You see that we got lots more energy out of coal than we got out of wood.

Then look at the energy that we get out of oil. Of course, as we look to the future, we need to find something that will at least come close to producing the kind of energy that we get from oil.

Our next slide relates to something the gentleman said about energy represents the ability to do work. Here we have a chart which lists the energy density in a variety of things that we get energy from.

To kind of put this in perspective, I would like to note that if we come down here to crude oil, I will give you some idea of the energy density of crude oil, one barrel of crude oil, 42 gallons, represents the energy from 25,000 man-hours of labor. That is about 12 man years of labor. That is the equivalent of having 12 people that work all year for you. And what will it cost you for that? $100 today, about $50 for the barrel of oil and maybe $50 to refine it and distribute it. So that is the kind of energy density that we get from fossil fuel.

Now, we are going to have to find something that comes close that that in the quantities we are using fossil fuels. We are talking about oil and gas. We use in our country 21 million barrels of oil a day. The rest of the world uses 63 million barrels of oil a day. That is 84 million barrels of oil a day total.

If you look here, you will see we did go to higher and higher energy density fuels. As we moved along, you can burn domestic refuge, and we ought to be doing that, by the way, instead of putting it in landfills. We ought to be burning that. Some are doing that. You get heat for the surrounding houses, you get electricity from it.

Brown coal, that is not very good coal. Straw, you can burn bailed straw, that is called biomass. There are lots of things you can do with biomass. In some parts of the world they burn dried dung. That also has lots of energy in it, about the same as wood.

Then we move to black coal, that is what we really mean by coal. You see coal has a higher energy density than wood. And here is coke and ethanol. Notice that ethanol has a lesser energy density than crude oil and diesel and petrol, that is what you put in your car. Naptha has a higher energy density, aviation fuel a still higher energy density, and natural gas, it was mentioned, the hydrogen content goes higher and higher in these so you get more energy out of it.

The gentleman from Michigan (Mr. EHLERS) mentioned the agricultural revolution. We have a chart here that looks at the agricultural revolution. This is a very interesting chart.

The top part of the chart shows how we get energy from petroleum, and it goes from petroleum clear down to gasoline and all of the energy inputs in the stages that are involved in doing that. You have to recover it. Here is the energy input that you need to recover it. You have to transport it. You have got to refine it. You have got to transport it again. And this is what you get from it, 1 million Btus of gasoline at the refueling station. And what did that cost you? It cost 1.23 million Btus. So about a fifth of all the energy you started with in petroleum now is gone in getting this gallon of gasoline.

Well, on the other side here we have now energy from ethanol, from corn. If you go down, we have to farm the corn, we have to produce it, we have to transport it, we have to produce it, we have to transport it again to where you are going to use it, and we still have the 1 million Btus, a little more than a gallon here, by the way, because it does not have the energy density of gasoline. But still we are making the equivalent 1 million Btus. Notice that that took 0.74 million Btus of fossil energy. The difference, of course, was the energy we got from the sun. So here we are capturing energy from the sun to make ethanol.

The bottom of this chart is really very interesting, because this points to a big problem that we face in this country particularly, and in the world in general, as the availability of fossil fuels winds down, because this is the total energy requirement that goes into a bushel of corn.

Notice the kind of energy that goes into that bushel of corn. Nearly half of it is nitrogen. That comes from natural gas. Before we learned how to get it from natural gas, the only place we got it from was barn yard manuers or plants that put it in the soil in rotation farming or guano that we mine from bath caves and tropical islands.

Notice as we go around this pie, the input of oil. Here we have input hauling, that is oil. Water, that was moved probably with energy from fossil fuels. Chemicals, a lot of host chemicals are made from fossil fuels, an enormous petrochemical industry. Custom work. The fellow came in to do custom work, he used some oil. His tractor was made with oil. Natural gas. Electricity. Natural gas goes along with oil. Electricity could have been produced with natural gas or oil. Propane, again, a product of fossil fuels. Gasoline, diesel.

So far, almost everything here is the product of oil or oil itself, is it not? And then we get to some things we mine. We can mine phosphate, lime and potash, but it takes energy to mine those and that energy probably came from oil. So the food you eat in a very real sense is oil, is it not, because that is where the energy came from to produce that food.

Then you have the very interesting chart of income savings and inheritance, and I have a chart here that looks at some of the alternatives. These have been mentioned. We will just spent a couple of moments looking at these alternatives, because we have been talking about it this evening.

We have some finite resources and we need to husband those carefully. We need to use them only as we have to. Some of them will not be very valuable. Tar sands and oil shale may cost you almost as much to get the energy as you get out of the energy after you have gotten it. Coal, and I want to put a coal chart up here in just a moment, because that is a very interesting one. And then nuclear. Several of the speakers have mentioned nuclear this evening.

There are three kinds of ways you can get power from nuclear. Fusion, I hope we get there. If we get there we are home free, are we not? I think the odds of getting there are not all that good, so you better not bank on it, the same way you better not bank on solving your personal economic problems by winning the lottery. That would be nice too, but the odds are not real high that you are going to do it. Then there is the light water reactor, which we have, and then there is the breeder reactor, which we do not have, which we are certainly going to have to look at if we are going to be serious of getting nuclear energy.

Then there is a whole list of renewables here. These are the ones we really need to be focusing on. But the big challenge here is, and I want to put the last chart up, is to move so we can make do with the energy from these alternatives, because it is not going to be as available in as large a quantity or with the energy density of the fossil fuels. So I want to put up the last chart, and that is the chart that shows the things we need to be doing.

These are the kind of things we need to be doing. The first thing we need to be doing is voluntary conservation. Let me put up very quickly the chart that shows California. This is a really interesting one.

It shows that you do not have to depreciate the quality of life to useless energy. Californians use about 60 percent as much energy per person as in the rest of the country. It would be hard to argue they do not have a good lifestyle.

Let me put this down and look at the next one. The next thing we need to do, we need to organize voluntary conservation. If we can organize, we can do a little better job. Then this is with the government cuts in now. We need to have monetary incentives, some policies for volunteer conservation. We have to conserve to buy time so we can use the fossil fuels remaining, not only total fuel our present economy, to make the investment we need to make in these renewables so we will be able to sustain ourselves for the duration.

Then we need to go to efficiency. We have done a lot with efficiency. Your present refrigerator is at least twice as good as the one 20 years ago in terms of efficiency. Then again the government is involved, we need to have monetary incentives and policies for efficient technologies.

I would say to the gentleman from Michigan (Mr. EHLERS), we should have

been moving down this path for the last 25 years, because in 1980 we knew absolutely moving down Hubbard's Peak. Tomorrow I think we have another opportunity in one of these special order hours to talk about this. We will be able to do this in more detail. I thank the gentleman for yielding to me and for organizing this hour this evening.

Mr. EHLERS. Mr. Speaker, reclaiming my time, I thank the gentleman from Maryland. The gentleman has given an excellent presentation. Unfortunately, we do not have time to go into details, but as the gentleman mentioned, I believe we have other time next week when we can do that. I look forward to hearing more from the gentleman about his field of expertise.

Mr. Speaker, I would also enter into the record a letter from the Energy Future Coalition which was sent to President George W. Bush along with some attached material which I think is very important for our colleagues to peruse and it will certainly be of interest to other people in this Nation.

I want to thank the four gentlemen who joined me here this evening, all of them are experts in different areas relating to energy. They have done an excellent job of presenting things, and I hope this clarifies the energy situation and sheds some light on our efforts to ensure that we advance energy efficiency, advance energy conservation, advance development of new sources of energy, and, in particular, in terms of the chart I used, let us get away from using our savings; let us get on to using our income and some of our inheritance so that we have a balanced economy in the future and a safer Nation.

'SET AMERICA FREE' A BLUEPRINT FOR U.S. ENERGY SECURITY

INTRODUCTION

Historically, the United States has pursued a three-pronged strategy for minimizing the vulnerabilities associated with its dependency on oil from unstable and/or hostile nations: diversifying sources of oil, managing inventory in a strategic petroleum reserve and increasing the efficiency of the transportation sector's energy consumption. In recent years, the focus has been principally on finding new and larger sources of petroleum globally.

Rapidly growing worldwide demand for oil, however, has had the effect of largely neutralizing this initiative, depleting existing reserves faster than new, economically exploitable deposits are being brought on line. Under these circumstances, diversification among such sources is but a stop-gap solution that can, at best, have temporary effect on oil supply and, hence, on national security. Conservation can help, but with oil consumption expected to grow by 60 percent over the next 25 years, conservation alone will not be a sufficient solution.

THE 'SET AMERICA FREE' PROJECT

Long-term security and economic prosperity requires the creation of a fourth pillar—technological transportation of the transportation sector through what might be called ''fuel choice.'' By leading a multinational effort rooted in the following principles, the United States can immediately begin to introduce a global economy based on next-generation fuels and vehicles that can utilize them:

Fuel diversification: Today, consumers can choose among various octanes of gasoline, which accounts for 45 percent of U.S. oil consumption, or diesel, which accounts for almost another fifth. To these choices can and should promptly be added other fuels that are domestically produced, where possible from waste products, and that are clean and affordable.

Real world solutions: We have no time to wait for commercialization of immature technologies. The United States should implement technologies that exist today and are ready for widespread use.

Using existing infrastructure: The focus should be on utilizing competitive technologies that do not require prohibitive or, if possible, even significant investment in changing our transportation sector's infrastructure. Instead, ''fuel choice'' should permit the maximum possible use of the existing refueling and automotive infrastructure.

Domestic resource utilization: The United States is no longer rich in oil or natural gas. It has, however, a wealth of other energy sources from which transportation fuel can be safely, affordably and cleanly generated. Among them: hundreds of years worth of coal reserves, 25 percent of the world's total (especially promising with Integrated Gasification and Combined Cycle technologies); billions of tons a year of biomass, and further billions of tons of agricultural and municipal waste. Vehicles that meet consumer needs (e.g., ''plug-in'' hybrids), can also tap America's electrical grid to supply energy for transportation, making more efficient use of such clean sources of electricity as solar, wind, geothermal, hydroelectric and nuclear power.

Environmentally sensible choices: The technologies adopted should improve public safety and respond to the public's environmental land health concerns.

KEY ELEMENTS OF THE 'SET AMERICA FREE' PROJECT

Vehicles

Hybrid electric vehicles: There are already thousands of vehicles on America's roads that combine hybrid engines powered in an integrated fashion by liquid fuel-powered motors and battery-powered ones. Such vehicles increase gas-consumption efficiency by 30-40 percent.

Ultralight materials: At least two-thirds of fuel use by a typical consumer vehicle is caused by its weight. Thanks to advances in both metals and plastics, ultralight vehicles can be affordably manufactured with today's technologies and can roughly halve fuel consumption without compromising safety, performance or cost effectiveness.

''Plug-in'' hybrid electric vehicles: Plug-in hybrid electric vehicles are also powered by a combination of electricity and liquid fuel. Unlike standard hybrids, however, plug-ins draw charge not only from the engine and captured braking energy, but also directly from the electrical grid by being plugged into standard electric outlets when not in use. Plug-in hybrids have liquid fuel tanks and internal combustion engines, so they do not face the range limitation posed by electric-only cars. Since fifty-percent of cars on the road in the United States are driven 20 miles a day or less, a plug-in with a 20-mile range battery would reduce fuel consumption by, on average, 85 percent. Plug-in hybrid electric vehicles can reach fuel economy levels of 100 miles per gallon of gasoline consumed.

Flexible fuel vehicles (FFVs): FFVs are designed to burn on alcohol, gasoline, or any mixture of the two. About four million FFV's have been manufactured since 1996. The only difference between a conventional car and a flexible fuel vehicle is that the latter is equipped with a different control chip and some different fittings in the fuel line to accommodate the characteristics of alcohol. The marginal additional cost associated with such FFV-associated changes is currently under $100 per vehicle. That cost would be reduced further as volume of FFVs increases, particularly if flexible fuel designs were to become the industry standard.

Flexible fuel/plug-in hybrid electric vehicles: If the two technologies are combined, such vehicles can be powered by blends of alcohol fuels, gasoline, and electricity. If a plug-in vehicle is also a FFV fueled with 80 percent alcohol and 20 percent gasoline, fuel economy could reach 500 miles per gallon of gasoline.

If by 2025, all cars on the road are hybrids and half are plug-in hybrid vehicles, U.S. oil imports would drop by 8 million barrels per day (mbd). Today, the United states imports 10 mbd and it is projected to import almost 20 mbd by 2025. If all of these cars were also flexible fuel vehicles, U.S. oil imports would drop by as much as 12 mbd.

Fuels

Fuel additives: Fuel additives can enhance combustion efficiency by up to 25 percent. They can be blended into gasoline, diesel and bunker fuel.

Electricity as a fuel: Less than 2 percent of U.S. electricity is generated from oil, so using electricity as a transportation fuel would greatly reduce dependence on imported petroleum. Plug-in hybrid vehicles would be charged at night in home garages—a time-interval during which electric utilities have significant excess capacity. The Electric Power Research Institute estimates that up to 30 percent of market penetration for plug-in hybrid electric vehicles with 20-mile electric range can be achieved without a need to install additional electricity-generating capacity.

Alcohol fuels: ethanol, methanol and other blends:

Ethanol (also known as grain alcohol) is currently produced in the U.S. from corn. The industry currently has a capacity of 3.3 billion gallons a year and has increased on the average of 25 percent per year over the past three years. Upping production would be achieved by continuing to advance the corn-based ethanol industry and by commercializing the production of ethanol from biomass waste and dedicated energy crops. P-Series fuel (approved by the Department of Energy in 1999) is a more energy-efficient blend of ethanol, natural gas liquids and ether made from biomass waste.

Methanol (also known as wood alcohol) is today for the most part produced from natural gas. Expanding domestic production can be achieved by producing methanol from coal, a resource with which the U.S. is abundantly endowed. The commercial feasibility of coal-to-methanol technology was demonstrated as part of the DOE's ''clean coal'' technology effort. Currently, methanol is being cleanly produced from coal for under 50 cents a gallon.

It only costs about $60,000 to add a fuel pump that serves one of the above fuels to an existing refueling station.

Non-oil based diesel: Biodiesel is commercially produced from soybean and other vegetable oils. Diesel can also be made from waste products such as tires and animal by-products, and is currently commercially produced from turkey offal. Diesel is also commercially produced from coal.

Policy Recommendations

Provide incentives to auto manufacturers to produce and consumers to purchase, hybrid vehicles, plug-in hybrid electric vehicles and FFVs across all vehicle models.

Provide incentives for auto manufacturers to increase fuel efficiency of existing, non-FFV auto models.

Conduct extensive testing of next-generation fuels across the vehicle spectrum to meet auto warranty and EPA emission standards.

Mandate substantial incorporation of plug-ins and FFVs into federal, state, municipal and covered fleets.

Provide investment tax incentives for corporate fleets and taxi fleets to switch to plug-ins, hybrids and FFVs.

Encourage gasoline distributors to blend combustion enhancers into the fuel.

Provide incentives for existing fueling stations to install pumps that serve all liquid fuels that can be used in the existing transportation infrastructure, and mandate that all new gas stations be so equipped.

Provide incentives to enable new players, such as utilities, to enter the transportation fuel market, and for the development of environmentally sound exploitation of non-traditional petroleum deposits from stable areas (such as Canadian tar sands).

Provide incentives for the construction of plants that generate liquid transportation fuels from domestic energy resources, particularly from waste, that can be used in the existing infrastructure.

Allocate funds for commercial scale demonstration plants that produce next-generation transportation fuels, particularly from waste products.

Implement federal, state, and local policies to encourage mass transit and reduce vehicle-miles traveled.

Work with other oil-consuming countries towards distribution of the above-mentioned technologies and overall reduction of reliance on petroleum, particularly from hostile and potentially unstable regions of the world.

A NEW NATIONAL PROJECT

In 1942, President Roosevelt launched the Manhattan Project to build an atomic weapon to be ready by 1945 because of threats to America and to explore the future of nuclear fission. The cost in today's prices was $20 billion. The outcome was an end to the war with Japan, and the beginning of a wide new array of nuclear-based technologies in energy, medical treatment, and other fields.

In 1962, President Kennedy launched the Man to the Moon Project to be achieved by 1969 because of mounting threats to U.S. and international security posed by Soviet space-dominance and to explore outer space. The cost of the Apollo program in today's prices would be well over $100 billion. The outcome was an extraordinary strategic and technological success for the United States. It engendered a wide array of spin-offs that improved virtually every aspect of modern life, including but not limited to transportation, communications, health care, medical treatment, food production and other fields.

The security of the United States, and the world, is no less threatened by oil supply disruptions, price instabilities and shortages. It is imperative that America provide needed leadership by immediately beginning to dramatically reduce its dependence on imported oil. This can be done by embracing the concepts outlined above with a focus on fuel choice, combined with concerted efforts at improving energy efficiency and the increased availability of energy from renewable sources.

The estimated cost of the ''Set America Free'' plan over the next 4 years is $12 billion. This would be applied in the following way: $2 billion for automotive manufacturers to cover one-half the costs of building FFV-capability into their new production cars (i.e., roughly 40 million cars at $50 per unit); $1 billion to pay for at least one of every four existing gas stations to add at least one pump to supply alcohol fuels (an estimated incentive of $20,000 per pump, new pumps costing approximately $60,000 per unit); $2 billion in consumer tax incentives to procure hybrid cars; $2 billion for automotive manufacturers to commercialize plug-in hybrid electric vehicles; $3 billion to construct commercial-scale demonstration plants to produce non-petroleum based liquid fuels (utilizing public-private cost-sharing partnerships to build roughly 25 plants in order to demonstrate the feasibility of various approaches to perform efficiently at full-scale production); and $2 billion to continue work on commercializing fuel cell technology.

Since no major, new scientific advances are necessary to launch this program, such funds can be applied towards increasing the efficiencies of the involved processes. The resulting return-on-investment—in terms of enhanced energy and national security, economic growth, quality of life and environmental protection—should more than pay for the seed money required.

Gary L. Bauer, President, American Values.

Milton Copulos, National Defense Council Foundation.

Congressman Eliot Engel.

Frank Gaffney, Center for Security Policy.

Bracken Hendricks, Apollo Alliance.

Col. (ret.) Bill Holmberg, American Council on Renewable Energy.

Anne Korin, Institute for the Analysis of Global Security.

Deron Lovaas, Natural Resources Defense Council.

Gal Luft, Institute for the Analysis of Global Security.

Cliff May, Foundation for the Defense of Democracies.

Hon. Robert C. McFarlane, Former National Security Advisor.

Daniel Pipes, Middle East Forum.

Professor Richard E. Smalley, 1996 Nobel Laureate in Chemistry.

Admiral James D. Watkins, Former U.S. Secretary of Energy.

Hon. R. James Woolsey, Former director of the CIA, Co-Chairman, Committee on the Present Danger.

Meyrav Wurmser, Hudson Institute.

ENERGY FUTURE COALITION
Washington, DC, March 24, 2005.

Hon. GEORGE W. BUSH, President of the United States,
The White House,
Washington, DC.

DEAR MR. PRESIDENT: As individuals with a deep commitment to our nation's security and well-being, we share our overriding concern for the protection of the United States. That is why we have come together to urge you and your Administration to focus anew on a matter that directly affects our national security: America's growing dependence on foreign oil.

We believe that: The United States' dependence on imported petroleum poses a risk to our homeland security and economic well-being. Increasing petroleum consumption by developing economies like China and India will exacerbate this risk. Some foreign interests have used oil revenues in ways that harm our national security. With only two percent of the world's oil reserves but 25 percent of current world consumption, the United States cannot eliminate its need for imports through increased domestic production along. An equivalent emphasis on demand-side measures—development and deployment of clean, domestic petroleum substitutes and increased efficiency in our transport system—is essential.

You have recognized the threat. As you said on the South Lawn on February 25, 2002, dependence on foreign oil ''is a challenge to our economic security, because dependence can lead to price shocks and fuel shortages. And this dependence on foreign oil is a matter of national security. To put it bluntly, sometimes we rely upon energy sources from countries that don't particularly like us.''

Mr. President, we agree. We are writing today to urge that the United States respond—as it has so ably to other national security challenges—with a focused, determined effort that accepts nothing less than success. To reduce the risk of an oil shock in a global market, we must reduce our use of foreign oil. We ask that you launch a major new initiative to curtail U.S. consumption through improved efficiency and the rapid development and deployment of advanced biomass, alcohol and other available petroleum fuel alternatives.

Most importantly, we believe that, to demonstrate our seriousness and resolve, this effort must be funded at a level proportionate with other priorities for our nation's defense. An investment of no more than $1 billion over the next five years, for example, would establish a domestic alternative fuels industry that could significantly reduce our consumption of foreign oil.

We do not know today what form a crisis over oil will take, but we know that a crisis is coming—one that could harm the United States. Action to prepare for that day will pay dividends for our national security, out international competitiveness, and our future prosperity. We respectfully urge that you call on the Congress to join you in supporting the funding and other strong measures needed to reduce our dependence on foreign oil, such as those set out in our enclosed Findings and Recommendations. As Sun Tzu wrote, ''The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him.''

Sincerely,

ROBERT C. MCFARLENE,
R. JAMES WOOLSEY,
FRANK J. GAFFNEY, Jr.,
C. BOYDEN GRAY,
TIMOTHY E. WIRTH.

Additional Signatories

Lt. Gen. John S. Caldwell, Jr., USA (Ret.).

Milton R. Copulos, National Defense Council Foundation.

Adm. William T. Crowe, Jr., USN (Ret.); former Chairman of the Joint Chiefs of Staff.

Hon. John H. Dalton, Former Secretary of the Navy.

Vice Adm. Robert F. Dunn, USN (Ret.).

Brig. Gen. Gordon Gayle, USMC (Ret.).

Hon. Sherri W. Goodman, Former Deputy Under Secretary of Defense.

Vice Adm. Lee Gunn, USN (Ret.); Institute for Public Research, Center for Naval Analysis.

David A. Harris, American Jewish Committee.

Hon. Gary Hart, Former U.S. Senator; Co-Chair, U.S. Commission on National Security for the 21st Century.

Rear Adm. Leland S. Kollmorgen, USN (Ret.).

Gen. Richard L. Lawson, USAF (Ret.); former President, National Mining Association.

Gal Luft, Institute for the Analysis of Global Security.

Lt. Gen. William R. Maloney, USMC (Ret.).

Clifford D. May, Foundation for the Defense of Democracies.

Vice Adm. Dennis V. McGinn, USN (Ret.).

Hon. William A. Nitze, The Gemstar Group.

John L. Peterson, The Arlington Institute.

Hon. Robert B. Pirie, Jr., Former Secretary of the Navy (acting).

Hon. John D. Podesta, Center for American Progress; former White House Chief of Staff.

The Hon. David Oliver, Jr., Former Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics.

Hon. Joe R. Reeder, Former Under Secretary of the Army.

Maj. Gen. J. Milnor Roberts, USAR (Ret.).

Vice Adm. Richard H. Truly, USN (Ret.); former Director of the National Renewable Energy Laboratory.

Adm. James D. Watkins, USN (Ret.); former Secretary of Energy.

ENERGY FUTURE COALITION

THE NATIONAL SECURITY AND PETROLEUM DEPENDENCE PROJECT

Findings and Recommendations

Findings: U.S. dependence on foreign petroleum poses a serious risk to our national and homeland security as well as our economic well-being; Increasing petroleum consumption by developing economies like China and India will exacerbate this risk; Some foreign interests have used oil revenues to purchase destabilizing weapons or to support terrorism; With just 2 percent of the world's oil reserves and 25 percent of current world consumption, the U.S. cannot eliminate its need for imports through increased domestic production alone; equivalent demand-side measures are essential; Technologies exist today that can improve efficiency and produce clean, domestic petroleum substitutes; The cost of action is far smaller than the risk of inaction, and there is no excuse for further delay.

Recommendation:

1. It should be a top national security priority of the United States to significantly reduce its consumption of foreign oil through improved efficiency and the rapid substitution of advanced biomass, alcohol and other available alternative fuels, and this effort should be funded at a level proportionate with other priorities for the defense of the nation.

2. In addition to research and development, such investments should include tax credits and other incentives to encourage: (a.) Rapid production and consumer purchase of advanced vehicles like hybrids, plug-in hybrids and flexible fuel vehicles; (b.) Production of more efficient vehicles across all models; (c.) Construction of domestic facilities to produce alternative fuels from domestic resources; and (d.) Wide deployment of alternative liquid fuel options at existing fueling stations.

3. The Federal Government should consider mandating substantial incorporation of hybrids, plug-in hybrids and flexible fuel vehicles into federal, state, municipal and other government fleets.

PAYING TRIBUTE TO NATIONAL LAW ENFORCEMENT OFFICERS AND FIRST RESPONDERS

The SPEAKER pro tempore (Mr. FITZPATRICK of Pennsylvania). Under the Speaker's announced policy of January 4, 2005, the gentleman from Michigan (Mr. STUPAK) is recognized for 60 minutes.

Mr. STUPAK. Mr. Speaker, I thank you for the opportunity to say a few words tonight. I would like to change the subject from energy to the energy we see day in and day out on our Nation's streets, towns and communities and homes, and that is that this week is National Law Enforcement Week. I rise to pay tribute to our law enforcement officers and first responders who have so bravely protected and served our Nation, often putting their own lives at risk.

Since September 11, 2001, many in this Nation and this Congress have come to recognize the importance of the sacrifices made by men and women in law enforcement. As a former police officer with the Michigan State Police and the Escanaba City Police Department, as well as the founder and co-chair of the Law Enforcement Caucus, this week has special meaning to me.

The focus of this week will take place Friday evening, when 153 law enforcement officers killed in the line of duty in 2040 as well as 262 other officers killed in prior years will be formally added to the Peace Officers Memorial at the 2005 National Candlelight Vigil at the National Law Enforcement Memorial here in Washington, D.C.

The addition of these officers' names to the memorial is one way in which our Nation can commemorate its fallen heroes who have died in the line of duty. This week allows law enforcement officers and their families to gather together in one place and honor those who have lost their lives.

According to the National Law Enforcement Officers Memorial Fund, more than 16,656 Federal, State and local law enforcement men and women in the United States have been killed in the line of duty through 2004. In 2004, of the 153 fallen officers, sadly seven of these officers are from my home State of Michigan.

That is why it is especially important during this special week that we not only recognize the dedication of these officers, but also commit to providing our law enforcement officers with the resources they need to meet the daily challenges of their jobs, particularly at a time when we place greater demands on them to fight and prevent terrorism here all across America.

We can provide these resources only by fully funding important law enforcement grant programs that allow our local agencies to buy essential protective gear, hire the officers they need and obtain all the resources they need to make themselves and our communities safe.

Congress can provide these resources through grants, especially through the Community Oriented Police Services, or COPS Program, as we know it. This COPS Program was so successful that it helped to put 100,000 police officers on the street under President Clinton. It is critical that Congress continue to fully fund this program.

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Unfortunately, the President's budget, which we really just recently passed, devastates the COPS program, requesting only $117.8 million for this important program. That is $381.2 million below last year's level. That is more than almost a 200, 300 percent cut in this program. The President's budget also zeroes out the Edward Byrne Memorial Justice Assistance grant program that provides funding for 19 different programs for counterdrug initiatives in rural communities for funding our jails, and 19 different programs to allow local law enforcement to do what is necessary in their communities to best serve and protect their people. These grants are used to administer, as I said, vital programs such as multi-jurisdictional drug enforcement teams, anti-drug education programs, treatment programs, staffing our jails, running investigative bureaus, and also all the way to alternative sentencing initiatives.

If enacted, the President's budget cuts will have far-reaching effects on our local law enforcement communities. Local drug enforcement teams are crucial to keeping our communities drug-free. If the Byrne grant programs are zeroed out, as they are required to be underneath our budget, they will be unable to hire officers needed to sustain their drug enforcement teams.

Let me tell my colleagues, when it comes to drug abuse, no community, urban or rural, is immune from this problem. To highlight how important these local teams are to our rural districts, there is a recent article in our local newspapers in my first congressional district of Michigan. On April 13, HUNT, or also known as the Huron Undercover Narcotics Teams seized 3,000 Oxycontin tablets from a home in the rural part of Presque Isle. This is just one example of the critical work these narcotic teams do day in and day out to keep drugs out of our communities and our schools.

This country's drug problems are not going to go away with this one bust. In fact, with the emergence of prescription drugs used and dealt illegally like Oxycontin, some would argue the problem is only getting worse. My question is, why are we zeroing out the funding that enables programs like HUNT, the Huron Undercover Narcotics Team, to exist and combat this problem that is only growing more severe.

Congress also needs to provide assistance to help regional law enforcement officers and first responders talk to each other in a time of emergency. It is called interoperability. My bill, H.R. 3370, the Public Safety Interoperability Act, would provide grants to local law enforcement agencies to modernize their communications systems and become interoperable. Interoperability of an officer's communications system would allow different police agencies in different jurisdictions to communicate with each other in time of crisis.

Currently, firefighters and law enforcement officials may not be able to talk to each other, even if they work in the same jurisdiction. The tragic events of September 11 only illustrates and highlights why it is so important that our law enforcement officials are fully able to talk to each other via interoperability. Mr. Speaker, 343 firefighters and 72 law enforcement officers lost their lives in the World Trade Center on September 11, and 121 of the brave firefighters lost their lives due to the fact that they were unable to talk