to buy health care and to make the choices and to be held accountable and responsible for the choices that they make. When they make great choices, they will benefit. Yes, they will have the freedom to make, perhaps, some wrong choices, but that is what makes America great. When we make wrong choices, we will learn and we will improve, but let's make sure that we fight for freedom.

The time to fight for freedom is today, and it is on this issue, and we need to move forward. There is nothing more important for us to do than to move forward and to reform health care, but to do it in such a way that empowers individuals and not Washington.

With that, Mr. Speaker, I yield back the balance of my time.

ENERGY AND TECHNOLOGY OPTIONS

The SPEAKER pro tempore. Under the Speaker's announced policy of January 6, 2009, the gentleman from New York (Mr. MASSA) is recognized for 60 minutes.

Mr. MASSA. Mr. Speaker, I thank you for the opportunity to rise today to discuss something that has become exceptionally important to me and to many in my district. In fact, it has become exceptionally important to individuals all over this country.

I ask the Speaker's indulgence tonight to engage both on a short and technical historical discussion of a technology that not only holds great promise for the United States but, in fact, for the world; and I appreciate the Speaker's indulgence as I do so.

It was a pivotal time in history, just about 100 years ago, when motorized transportation was, in fact, in its infancy, and our country and its transportation industry faced a very important choice: Should the energy for powering the newly developed horseless carriage come from electricity and batteries, or should it come from the internal combustion engine and petroleum fuels?

Remember, please, that both of these technologies—and it's hard for us to imagine—were at that time brand new. Both technologies had been established in the fledgling motorized transport industry from the beginning. There were down sides to both choices.

Batteries were heavy; took up a lot of space and took a long time to reenergize or, as we come to call it today, recharge. Whereas, internal combustion engines were noisy. They scared a lot of horses; required fuel that was both difficult to come by; they were scarce, smelly and volatile. Our other choice, the electric drive, or the internal combustion engine, would require a huge investment in the development of a nationwide infrastructure.

Obviously, the choices taken then heavily favored the internal combustion engine. By a large margin, the internal combustion engine outperformed electric drive; carried more passengers; could carry more cargo; could go farther while taking far less time to refill its on-board energy supply. This was for the fundamental reason that, by both weight and volume, more energy was contained in petroleum fuels, and they could then be packaged in batteries.

Thus, for the last 100 years and continuing today, petroleum-dependent internal combustion engines dominate every common mode of motorized transportation, but some things have not changed in 100 years. Batteries, no matter how improved, are still heavy. They take up a lot of space, and they require an awful long time to recharge.

□ 2200

Internal combustion engines, however improved, still scare a lot of horses, at least back where I am from, are still noisy, and require a fuel that is both smelly, hard to come by and volatile.

Among the things that have changed is our realization of the long-term consequences of our earlier choices. Increasingly in recent decades we have come to realize that there are many compelling flaws in our choices for internal combustion engines: The noise, the smell, the volatility, the scarcity of the fuel. The overriding concern now and the overriding environmental impact and national security considerations dominate today's discussions.

But that is not all. In the complex and dangerous world in which we live, international industrial competitiveness and domestic access to advanced technologies are now paramount. So, as with 100 years ago, much is at stake for our country and for the world in the decisions we make now. And as we are consumed in internal domestic debates over things like health care and other critical issues that we face, Mr. Speaker, I pause tonight to talk about advanced technologies.

Fortunately, the automotive industry and governments around the world have foreseen the present, what we face today, and they have been making preparations. Clearly, solutions to the environmental impact and energy security issues that we are facing have been embraced by the automotive industry, and technologies to move us to a future of clean environment and energy independence are now at hand and at the ready.

The automotive industry has proven its commitment by inventing and investing in these technologies and products, and governments have professed their support through statements such as the following from our President, Barack Obama, just recently on March 19th of this year. Mr. Speaker, please allow me to quote:

''So, we have a choice to make. We can remain one of the world's leading importers of foreign oil, or we can make the investments that would allow us to become the world's leading exporter of renewable energy. We can let climate change continue to go unchecked, or we can help to stop it. We can let the jobs of tomorrow be created abroad, or we can create those jobs right here in America and lay the foundation for lasting prosperity.''

National energy and environmental goals have already been set. We must address America's incredibly and increasingly dangerous dependence on petroleum and reduce the approximately 140 billion gallons of gasoline that U.S. drivers use every year—140 billion gallons of gasoline—and every year more and more of it imported from the very countries who would both do us economic and national security harm.

To meet these challenges, we must embrace the ingenuity of our national research community, an ingenuity and national research community that took us to the moon and beyond, and we must take these technologies from their cradle of infancy through commercial deployment and development.

Understand that we are again at a pivotal point in history. We are standing at the threshold of the greatest single paradigm shift in the entire history of motorized transportation. It has only been since the day we decided to shift from the horse and carriage to the horseless carriage that we have the options in front of us today. And only one phenomenon stands in the way of our accomplishing our national goals through the automobile industry, the phenomenon known as, and may I quote the automobile industry, ''the valley of death.''

The valley of death is an automotive industry reference to the treacherous territory between proven feasibility in the research laboratory and the commercially successful products in the marketplace. Every single new technology that we have come to enjoy in automobiles, from power brakes and power steering to factory air, has languished in the valley of death until it became a commercially available product in the mass market.

There are now four or five major technologies for us to choose from, and they are, from the most straightforward to the most technologically challenging, first, improved internal combustion engine technologies; next, internal combustion engine technologies that use alternative fuels, and we have already seen the increased deployment of things like corn and mixed cellulosic ethanol and hopefully future biodiesel. After that comes something we are somewhat familiar with, gasoline engine hybrids that we see deployed in commercial vehicles like the Prius. Next we will see electric hybrids, and, lastly, hydrogen fuel-cell technologies.

The least difficult of these technologies is the refinements to existing conventional engine technology, already discussed, and the most difficult are the advanced technologies that are brand new to the marketplace.

Automakers everywhere recognize that the technologies at the difficult end are the ones that cannot cross this automotive valley of death alone. Successful movement from research and development successes to market successes require the cooperation and support of national governments.

One of the most promising but highly threatened technologies is the hydrogen fuel cell. This technology has an impressive history and important implications for our Nation's energy portfolio. But we are at a point where we must decide, is it worth saving this technology and promoting a vast domestic hydrogen-fuel capability? I happen to believe it is.

Let me be very clear, speaking as an individual who spent most of my life in military uniform and the final years of my military career as a senior advisor to the commander of the North Atlantic Treaty Organization, where I witnessed firsthand the cooperation between the governments of NATO and their industries, this is a national security imperative.

In order for us to maintain our place in the world, we must maintain our industrial competitiveness, and that means we must have robust supply bases and parts manufacturing. We have let our ingenuity and investments in industry fail before, only to be picked up by foreign competitors, and then we pay the price for reimportation. It is dangerous to rely on their industries and not on ours. We must focus on maintaining a strong advanced-technology domestic industry, and we are in a good position. In fact, we are in the lead with respect to hydrogen fuel cells.

This is an energy issue involving national energy security. It involves sustainability that couples the capabilities of fuel cells with biofuels, hybrids, photovoltaic, wind. This is an entire portfolio. It is not one over the other, but the synergy of all of those technologies, and we cannot rely on foreign countries to power America. We must embrace domestic energy technologies for both their reliability and sustainability in the future.

If we are going to be a world leader with a strong domestic economy and not rely on foreign countries both for technology loans and for foreign loans, as we are today, we have to move forward in partnerships with industry. We risk maintaining and repeating the mistakes of the past.

In the late 1990s and the early 2000s, the United States Advanced Battery Consortium worked on battery research and development. Today, that battery technology has been commercialized and it is a market dominated by both Japanese and Korean manufacturing giants, not American.

From the early 1990s, the Department of Energy and General Motors have developed a U.S. fuel-cell program into what is today a global leadership position. Today, catching up quickly, there are announced programs from Germany and Japan, China and Korea, with huge investments to commercialize hydrogen fuel vehicles by 2015, and this will push the United States to a number three or worse position. I think this sounds all too familiar.

Mr. Speaker, I would like to refer to a series of charts to help us visually understand some of the challenges, the risks, and the benefits that we face today.

Back in 1968, we had the Electrovan. It was completely filled with fuel cells and hydrogen tanks and it was done in a van of that size because this technology at that time could not be miniaturized. It was so large, it required the entire interior volume of a van.

In 1997, the first Department of Energy and General Motors fuel stack, not yet packageable for a vehicle, became an industrial reality.

In 2007, a complete hydrogen fuel-stack system was packaged into a Chevrolet Equinox, and over 100 of these vehicles matched in their capabilities were built and deployed all over the United States. They are now on the road being driven by your neighbors and friends in test and pilot programs and have accumulated over 1 million road miles of research and development.

In the very near future and in the research and development centers today—I have seen them with my own eyes—is a Generation 2 system being readied for 2015, half the size of its predecessor, with increased performance, and it will be both not only lighter and smaller, but it will be progressively even smaller to fit into more styles of vehicles.

□ 2210

This, frankly, in this short of a period of time, is incredible technology progress. From the humble roots of this technology and a van full of equipment to today's Equinox fuel cells and beyond, the U.S. is the country that has advanced automotive hydrogen fuel cell technology, us, Americans, right here in the United States.

The Department of Energy Research and Development program, developed in partnership with domestic automobile manufacturers, was one of the best thought-out, most fully vested, periodically reviewed programs the Department of Energy has ever deployed. And the DOE invested to help advance this technology quickly towards production, and it set difficult technical goals to measure the progress of that program. The auto companies met or exceeded every single technology milestone placed before them. These included the size and weight of hydrogen fuel cell technology as both of those shrank significantly.

The technology was cold weather tested, and I cannot tell you, coming from upstate New York, how critical that is. It proved to be extremely versatile under multiple different environments. It was also done while improving durability, and current hydrogen fuel cell vehicles increased a mileage capability that before was unheard of, right now achieving some 800,000 miles—let me rephrase that, some 80,000 miles of lifetime between hydrogen fuel cell change-out, and the first commercial vehicles available in 2015 will have 125,000-mile durability capability between changing. That was unheard of just 10 years ago.

In the United States, billions and billions of dollars have been invested in government and private partnership to make hydrogen fuel cell vehicle technology a reality. The Department of Energy alone invested $2.3 billion in vehicle-related research and development. And General Motors, from their own coffers, invested $1.5 billion to place this company and this country at the forefront of hydrogen fuel cell research and development. Remember the goal, the billions and billions of gallons of gasoline we burn every year that will some day no longer be needed.

Hundreds of hydrogen fuel cell vehicles are currently on the road. Many major automotive companies have fleets. Preeminent among them, General Motors, but catching up quickly, Toyota, Honda, Hyundai, and Daimler. These are not some laboratory curiosity. Several automobile companies now loan or lease these vehicles to people just like you and me that take them home, park them in their garage, get up and take them to work the next morning. I know, because on my very first day as Member of the United States Congress just some 10 months ago, on a very cold January morning, I fired up a hydrogen fuel cell Equinox and drove it and its companion vehicle to the steps of the United States Capitol to demonstrate that this technology is no longer a laboratory miracle but is on the cusp of commercial development and deployment. So we've come a long way. And the question now is: Should we continue with this technology? Is this technology essential?

Mr. Speaker, let me turn to the next slide if I might. I'd like to talk for a moment about energy and technology options.

Energy security and the ability to reach emission gas reductions is critical. On this slide, we see in green, blue, and yellow, a library of our energy source portfolios: oil in its conventional, oil its nonconventional formats, biomass, natural gas and coal, renewables of many kinds, and nuclear. That's about what we have where we can go shopping for today's energy sources.

In the center is the type of fuel that those energies provide from a liquid fuel, and we know that to be diesel, gasoline, to gaseous fuels, which have special uses in niche markets like agriculture, propane, natural gas compressed, electric vehicles and hydrogen. And then we can talk about propulsion systems. Today, we have conventional internal combustion engines. We have internal combustion hybrids. That would be what we call and have come to be known as the Prius, plug-in hybrids, next generation, range-extended electric vehicles. We'll see those soon in a product called the Volt. Battery electric vehicles that have been around for quite a while are in use in many different ranges, and fuel cell hydrogen electric vehicles.

This is the menu that we can choose from, and it's absolutely critical that we maintain the broadest menu possible. So how do we avoid potential conflicts, unexpected shortages, foreign countries that will hold us hostage to a particular kind of energy, whether it be oil or nuclear fuel? How do we strive to move forward? We maintain a full menu of choices.

Now, some of these fuels have some limitations. We are very excited about biofuels, and certainly, based on my agricultural-dominated congressional district, I join in that. But they have a limitation. We can't fully meet demand based solely on biofuels, if for no other reason, because of land use requirements. We know and I've discussed briefly and will discuss in more detail that batteries have cost and weight problems. Let me illustrate this in the next slide, if I could.

There are different amounts of energy contained in different kinds of fuel, and, Mr. Speaker, if you will indulge me just a brief discussion of a technical nature. Today, if I want to drive 300 miles, it will take me approximately 72 pounds of diesel fuel. Now, if you take that amount of diesel fuel and you wrap it into the fuel delivery system, the piping, the pump, and the fuel tank, the total weight of that onboard device is about 94 pounds. If I want to do that with compressed hydrogen, the amount of hydrogen that I want to use contains 13.2 pounds. Now, why is that? That's because hydrogen, pound for pound, contains much more energy than does diesel fuel. It's an incredibly more efficient energy delivering fuel. But because it's a gas, it must be compressed and so its tank will weigh more. And the entire energy delivery system for a vehicle will weigh about 275 pounds. Well, that sounds like a lot more than the 94.8 pounds, but it's really only about 180 pounds heavier. That's about one passenger's worth. That's a very manageable technical challenge to engineers in the automotive industry.

But when we talk about batteries, it will take 1,829 pounds of Lithium ion batteries to allow me to drive 300 miles without recharging, and the delivery system, the encasement, the battery, cables, and the harnesses, will weigh about a total of 1,829, with 1,190 of that actually being the battery itself. Now, that has market value. There are urban uses for battery-powered vehicles, but long-range, high torque, high horsepower extended driving is not one of them. It is only through a high density, high energy fuel, in this case today, diesel or gasoline, and in the cars of tomorrow through hydrogen, that you can achieve that. Lithium ion batteries technically, because of the laws of physics, will never get us to where we have to go across a broad spectrum of driving requirements. It is simply not physically possible. In order to do this, I believe, and many experts join me, we have to harness the power of hydrogen through advanced fuel cell technology.

Now, petroleum and hydrogen have two other advantages. These vehicles can be refueled every 300 or so miles, and it takes about 3 to 10 minutes to do it. A battery electric vehicle requires overnight charging and it requires it to be done with a high-capacitance recharging system. That's fine if you have 8 or 9 hours to recharge your car. And there are many uses in urban America where that's possible, but not in long-range, high horsepower transportation requirements.

Let's talk, if I could, on the next slide, about the range, about the requirements of driving as we see them today in the United States. This brings the technology back to the consumer. On this chart, on a four-way arrow, here we talk about high loads. Now, those of us who come from farm country know that there's a lot of driving to be done agriculturally that requires heavy duty pickup trucks.

□ 2220

On the other hand, light-load driving for those in a much more urban environment, like a Los Angeles or Miami or New York City, recognize light-load small vehicles.

Then we go as far as range: continuous highway driving down Interstate 90 and Interstate 5, or short-burst driving as we go on errands from store to store. Battery electric vehicles perform very well in local light-weight driving, and they can do a great deal to lesson our burden on imported petroleum in that market. Extended-range electric vehicles can make that just a little bit better, but it's still about a four-passenger car.

Fuel cell vehicles are the only vehicles that will be able to meet a consumer demand for range; that's long-range highway driving—load requirements—that's heavy pickup truck-type requirements—and quick refilling time.

Diesel fuel for the near foreseeable future is probably going to be the fuel required to move heavy buses and heavy trucks over long-range routes. But imagine that they are a mere fraction of those billions of gallons of gasoline that we burn and import every year from overseas. There is a huge application for hydrogen fuel cells in meeting consumer demand for vehicles that have long-range, high-load requirements, and quick refilling time.

But can hydrogen fuel cell vehicles become a reality? Let's look at the next chart just where we were in the year 2000.

There are four myths that are currently being discussed with respect to hydrogen fuel cell vehicles. One of them is fuel cells are too expensive, and they're not durable enough. The reality is the cost benefit of a hydrogen fuel cell is measured in something called dollars per kilowatt. You measure the output in a kilowatt.

Now, just to bring this back to home, your average light bulb at home is 100 watts. So 10 of those turned on at the same time is one kilowatt. An Equinox extended-range hydrogen fuel cell vehicle today produces about 120 kilowatts of electricity, and significant cost reductions of this measurement have already been made just in the past 10 years from a plateau of $275 per kilowatt all the way down to today at 61 kilowatts, well on the way to the commercialized requirement of a 45-kilowatt vehicle. That's $45 per kilowatt.

Just last week the Department of Energy in its hydrogen program released a document confirming a current $61 per kilowatt in 2009 dollars projection. As shown on this chart, this is a reality today. Cost will be, and soon are, comparable to all other advanced technologies at high volumes of production, a high volume of production being 500,000 vehicles per year.

It was an incredibly difficult challenge put forth by the technicians of the Department of Energy, and the goals have been met or exceeded as developed by major automotive manufacturers right here in the United States. In fact, GM is on track to release a commercial model that meets or exceeds all durability and cost guidelines by 2015.

Myth two as shown on the next chart: hydrogen from natural gas is not an ideal source, and we don't have other options.

Let's go back to chemistry class when we were in high school. Hydrogen gas comes from two main sources: either something called reformatting natural gas or fundamental electrolysis. The reality today when you measure the amount of CO_2 that's expelled by a vehicle per mile driven as it is today, today's gasoline engines produce 540 grams, quarter of a kilogram, about half a pound, of CO_2 per mile. And we will be able to lower that to about 410 grams. If we just use and burn natural gas in a compressed tank, it's about 320. If we go to hybrid electric vehicles, of which there are four major types: gasoline, diesel, corn ethanol, and cellulosic ethanol, we can get it down to about 65 grams.

If we're talking about plug-in hybrids, today we have a gasoline hybrid that gives us a 240-gram-per-mile burn, and cellulosic ethanol can get it down to 150. It is only hydrogen fuel cell vehicles that meet the emissions requirements required for us to move forward.

If we take hydrogen and reformat it directly from natural gas, technology available today, we achieve a 200-gram-per-mile equivalent. That's half of the very best that we can get out of gasoline today. And if we go to hydrogen made from central wind electrolysis, it's almost untraceable. We actually achieve the goal of leaving nothing behind the vehicle but water vapor.

Natural gas is an abundant, domestic resource. We have it in quantity. Eleven billion kilograms of hydrogen already produced from natural gas in North America and 60 percent of this, enough fuel to power 21 million hydrogen fuel cell vehicles, is used to clean up petroleum in refinery operations today.

Natural gas-based hydrogen used to power hydrogen fuel cell vehicles is less than half of the greenhouse gas emissions of a conventional gasoline-powered vehicle. And looking forward, hydrogen, with near zero greenhouse emissions is possible, both from nuclear biomass and renewable electricity. In fact, solar arrays are in operation today that are producing hydrogen at generation efficiency twice of the Department of Energy's 2015 goals. This is not future science. This is science of today.

Myth number three—this is associated with hydrogen fuel cells—is that no good storage mechanism is available for transportation.

Most companies today use a 10,000 PSI compressed hydrogen tank. Vehicles use the storage tank, technology has been able to hook up to 300 miles. It was the technology that was in the vehicle that I drove from my home in Corning, New York, all the way down to Washington, DC. Compressed hydrogen offers all of the capabilities needed to begin commercialization of vehicles today. This, like all continuing research that goes on around the world, will progress. But it is a reality as we know it today.

Let's talk about myth four, which is probably the most daunting issue facing America. And, Mr. Speaker, I appreciate your indulgence in what is increasingly technological conversation.

Distribution infrastructure isn't there, and there are no plans to establish it. That's myth number four. The reality is that the infrastructure challenge is solvable. Stations are here now, and according to the National Hydrogen Association of the United States, we currently have 75 stations located around the country, most in New York and California, with 44 more planned over the next 2 years.

Like the Eisenhower Interstate Highway System or the international and national railroad systems, or our own aircraft and airport infrastructure, this will require a national involvement, a national government involvement, which will result in jobs and lots of them. It will create entirely new industries, industries that cannot be exported; and it will be a tremendous stimulus to the U.S. economy in and of itself.

To roll out this infrastructure, all we need to do is start with nodes and then connect them, and the work has already started. It doesn't require a miracle. It only requires the will and the national focus to do it.

Here we see to my right several of the stations that are already being designed and implemented for commercial exploitation around the world. In places like the University of California Irvine, in Germany, right here in Washington, DC., where I refilled the hydrogen fuel cell vehicle that I drove from Corning, and in Berlin, Germany, where they have taken that design—and I will talk soon about its mass introduction throughout their entire highway system.

Again, it doesn't require a miracle, only the national will to do so.

Let us take a look at the next slide and see how we can actually manage this transformation and manage it quickly.

We start with select high-profile stations; and then we move to the next stage, about 40 stations per large metro area. Here we see both New York City and Los Angeles, just two examples.

Thirty metro stations for the entire metropolitan Los Angeles area will provide a network where no matter where you are, you are only 3.6 miles from a hydrogen filling station. Add 10 stations outside of the metro area, and that's what you need to allow consumers to meet their average weekly and weekend needs. And in Los Angeles, by the way, it's important to view the driving patterns of consumers.

□ 2230

There are consumers who want to be able to drive to Las Vegas, San Diego, Santa Barbara, Palm Springs and Big Bear, but they don't necessarily transit north to that extended range, and so this has a particular viability in southern California. Similarly, New York State, my home State, has the potential for a ''hydrogen highway'' as described in previous work by the New York State Energy Research and Development Authority. You can build nodes and link them together along roads like Interstate 90.

But NYSERDA, the New York State Energy Research and Development Authority, recognizes that ''as with any vision, barriers to achieving our goals exist. The support needed must come from collaborative efforts among industry, as well as between industry and local, State, and Federal Government. Communication and cooperation will be required to overcome the technical, market, and policy challenges impeding the implementation of hydrogen energy systems.''

As a proof that this technology is here now, we only have to look at what is happening within the automotive industry, especially abroad where foreign governments and car companies are teaming up to tackle the challenges of commercializing hydrogen fuel-cell vehicles.

Let's take a look at some of those partnerships in the next slide. As I have said continually, the technology is here and here now, and those in the industry recognize the potential of hydrogen cars in the commercial market. The global automotive industry says that at the current pace, these vehicles will be on the road commercially by 2015. Major world automobile manufacturers have signed a Letter of Understanding as recently as September 9 of this year between Daimler, and they recognize the requirement of the synergy between hydrogen fuel cells and battery technologies. This letter went to energy companies all over the world and government organizations around their host countries.

To quote that letter, allow me to say, over the last decade, governments, original equipment manufacturers and automobile manufacturers and the entire energy sector have given special attention to the introduction of hydrogen as a fuel for road transportation, and they have given it the priority option to reach several goals associated both with emission management and CO_2 reduction. Battery and fuel-celled vehicles complement one another and can move us closer to the objective of sustained mobility.

Honda, Toyota, Renault Nissan, Opel and GM, Ford, Daimler, Kia and Hyundai have all made significant investments and are moving ahead aggressively, but it is here in the United States of America, quite frankly with American ingenuity, that we have taken a leadership position that today is being threatened by a lack of partnership and a lack of vision. Let me quote further from the letter that was put out by Daimler, in order to ensure a successful market introduction of fuel-cell vehicles:

''This market introduction has to be aligned with the build-up of the necessary hydrogen infrastructure. Therefore a hydrogen infrastructure network with sufficient density is required by 2015. The network should be built up from metropolitan areas via corridors into area-wide coverage.''

Mr. Speaker, others get it. And many in this country understand it as well. Foreign governments in Germany and Japan are listening to their automotive manufacturers. They are collaborating with those manufacturers to put production vehicles in the market and in the marketplace by 2015 and explore simultaneously the need to overcome infrastructure challenges. Working to blanket their countries with a national hydrogen fuel-station infrastructure that will free their countries from foreign oil. And we will be left side-lined, wondering how this happened.

In our next slide, the flags tell the story. Our competitors are passing us by. They will soon have government-supported fuel-cell fleets on the road for research and development and prototype testing, as well as the infrastructure to support it. China, Korea, Japan and Germany are all in the fight competing with the United States, all moving forward aggressively and, in fact, faster than we are to commercialize technologies that we invented here in the United States. Their industries and their governments are working together. In Japan and Germany, long-term government industrial collaborations have existed, and they are leveraging those collaborations and those partnerships to leapfrog over the United States and the work that we put in place initializing the very technologies that we may one day be threatened with having to reimport into this country.

China is also learning a lesson and watching us carefully and matching their incredible ability to literally reverse engineer anything and everything that is developed and placing their massive industrial strength behind it. There is no doubt that should they want to and should we surrender the lead, they will overtake us.

The bottom line is if we don't move on hydrogen fuel-cell technologies and the vehicles built from them and we do not move forward, someone else will, and we will end up buying it from them just as we have ended up buying hybrid technology from the very competitors who took it away from us after we invented it and moved that technology forward. We will be reliant on these foreign producers for this clean technology in the same way that we rely on foreign oil right now to power our automobiles.

Let's look at a specific on the next slide. Germany, an ally and an industrial partner, has developed a logical plan with government infrastructure developments and hydrogen fuel-cell automobiles to roll out H2 fueling stations over a very short period of time. To the far right we see in 2013 some 150 fueling stations, and by 2017, 1,000 hydrogen fuel-cell filling stations, allowing the Germans to access hydrogen technology all over their country. In just four short House of Representatives election cycles, they will be done. And we will be wondering how did it happen? How were we left behind? This is because countries all over the world have, or are developing, national hydrogen plans.

Mr. Speaker, allow me to show you in the next slide who some of those players on the global market are. Germany and Japan are leading globally and leapfrogging ahead of the United States. China is coming on strong and in the past has not respected other nations' intellectual property rights. This will allow them to not only catch up quickly but surpass us. And believe you me, they will and they are. Korea is also stepping up with its manufacturing partnership with Hyundai. All over the globe we see other countries realizing the promising future of this technology. We invented it here. We developed it here. We are manufacturing it here. And yet, we are at the cusp of surrendering it here.

In the big picture, manufacturers from Germany, Japan, Korea and China are now accelerating their movement forward, and they are doing so quickly with a massive government research and development program. They will likely soon have large fuel-cell fleets on the roads, even larger than General Motors' current research and development 119-car fleet. They are installing thousands of hydrogen fueling stations that will relieve their countries from the burden of foreign oil and establish a viable energy infrastructure that supports clean, renewable energy production within their own countries independent of importation. And they will be creating the tens of thousands of new green jobs that should be created and kept here in the United States of America.

We have seen this before. Not too long along ago, this country invested in battery electric vehicle technology. And I'm not talking about the investments that came out of the recent stimulus bill, but rather the investments that were made back in the 1980s. The Department of Energy invested to kick-start the technologies and advance them towards production, and a large automobile manufacturer in the United States built a small fleet of battery electric vehicles that were placed on the road with real world drivers, sort of like where GM is today with hydrogen fuel-cell vehicles. The United States, in particular one State in the United States, California, then shifted its focus, and the programs became economically unviable and went away quite dramatically.

Today, leaders in this technology, battery automotive technology, are in Korea, China and Japan. And yet, the research and development was done here in the United States of America.

By the way, this is not an anomaly. I could have told you the same story but replaced ''battery'' vehicles with the word ''hybrid'' vehicles. And yet, last year, as the price of gasoline spiked and the United States consumer market focused on hybrid vehicles, there were no commercially available, mass deployable, domestically manufactured hybrid vehicles. Why? Because we embarked on that technology and we allowed foreign manufacturers to capture it, thus forcing us to reimport it at significant capital costs to the United States. If all the other major countries have a very specific program in place, what do they know that we don't know?

Well, here is an aspect of it, Mr. Speaker, that I would like to leave you with tonight. Allow me to conclude with one final slide. This is not necessarily only an issue of commercial capabilities or of industrial capabilities. It is an issue of national security. The United States military sees a need for independent energy capabilities. This was recently outlined in an independent report by the Defense Science Board Task Force on DOD Energy Strategy. In recent letters from senior DOD officials, one individual quoted ''domestic leadership in advanced technologies such as fuel cells is of national importance.''

□ 2240

The task force concluded that the Department of Defense faces two primary energy challenges. Department of Defense energy operations suffer from unnecessarily high growing battle space fuel demand. Let's face it, an M1A2 Abrams tank powered by a gas turbine engine using aviation fuel burns a lot of gas. And we have seen over and over and over again in land, air, and sea warfare that the logistical requirements of moving fuel is one of the most important battlefield criteria.

In fact, in my own life, I learned at advanced war schools, such as the National War College and the Naval War College, that amateurs talk about bullets and guns and professionals talk about logistics. And logistics harbor around the movement of petroleum products for our aircraft, our tanks, and our ships. And we are increasingly and at farther ranges dependent on that. In fact, Mr. Speaker, just recently on the front page of a major Washington political newspaper the headlines read that a gallon of fuel used by the United States military in Afghanistan is costing the United States taxpayer $400.

Likewise, military installations both overseas and, of some significant national security curiosity, right here at home are completely dependent on a civilian electrical infrastructure grid. When the lights go out in New York City, they go out on any military base on the same electrical grid. There is no independent powering sources. This is not a position that we want our military to be in.

Hydrogen fuel cells can help the military address its own petroleum reduction requirements. Nontactical vehicle applications, these are the everyday administrative vehicles used all over the United States by the DOD, are a wonderful place to introduce this technology and move forward. And stationary hydrogen fuel cell storage and requirements are also a significant national security increase for our shoreside installations.

Fuel cells and nontactical vehicles will later enable tactical applications. And while it seems far fetched that we may one day have a fuel cell-powered tank, Mr. Speaker, I offer for consideration that those on the battlefield of the Civil War would have had a hard time imagining a gas turbine power aviation fuel Abrams M1A2 tank. We simply cannot rely on surrendering the promise of this technology and shipping it overseas.

Now, Mr. Speaker, with total transparency, I must confess that one of the reasons that I am so motivated and so passionate about this subject is that for the past 15 years, out of sight and out of mind, in a corner of my congressional district that most people did not even know existed, some 400 engineers, technicians, and support personnel have worked to bring the vision of petroleum-free transportation and independence from imported petroleum to reality.

Tonight and tomorrow, and hopefully into the future, the engineers and the technicians at the Honeoye Falls advanced fuel cell research and development facility have brought the future today. Their leader, Mr. Matthew Fronk, a man who will soon retire from his position and seek a leadership role in academia, is to be commended for his vision and for his leadership. And it is not he alone, because it is a classic example of the ability of private industry, in this case, General Motors, a company often maligned and much in the press, who has brought to the Nation a unique, forward-looking capability that no other Nation in the world today has, and yet we are at the cusp of losing them. Right when we had the future in our hands, brought to us by hardworking and highly educated, incredibly passionate and dedicated technicians and engineers, we are about to surrender it as we surrendered battery technologies, as we surrendered hybrid technologies.

So, Mr. Speaker, allow me to conclude by reading an article that appeared in CNN Money magazine just last week. It is titled, ''The Hydrogen Car Fights Back.'' President Obama is betting on biofuels and batteries, but that isn't stopping some automakers from investing in hydrogen fuel cars. As it appeared in Fortune magazine, I quote, ''The valley of death is auto industry speak. It is a metaphorical desert where emerging technologies reside while car executives figure out which of the experiments ought to make their way into actual cars. Every automotive leap forward has done time in the valley, turbo chargers, fuel injections, even gasoline electric hybrids like Toyota's Prius. Hydrogen fuel cell vehicles, the alternative energy flavor of the month back in 2003, are the ones languishing today, along with hovercraft and other assorted concept cars, but perhaps not for much longer.

A number of automakers are now renewing their push for hydrogen, and now it is looking as though hydrogen cars will make its way out of this conceptual vehicular valley of death. Last month, Daimler, the German Government, and several industrial companies announced a plan to build 1,000 hydrogen fuel cell stations across Germany. Days later, Daimler's CEO, Dieter Zetsche, showed off Mercedes Benz's latest hydrogen fuel cell effort, the F-Cell hatchback. Toyota, this summer, announced it will put hydrogen fuel cell cars into production by 2015. Honda, GM, and Hyundai all have hydrogen fuel cell programs running, and Honda has actually put vehicles—heavily subsidized by the car maker to be sure—in the hands of some real customers as opposed to its own engineers. Parenthetically, GM, today, is focusing most of its energy on the plug-in hybrid Chevy Volt, but the company still says it expects to have fuel cell technology ready for commercialization by 2015.

Mr. Speaker, as we debate the great issues of the day, and there are many to debate, we hear them on the floor of this House every afternoon and every evening, be it national foreign policy issues that weigh heavily on our minds in Iraq and Afghanistan, whether it be a contentious debate about health care, allow us not to lose the vision of the future. Allow us not to do what has been done before. Allow us not to forget and give away the decades of advancement and work that have accomplished so much in this very focused area of technological development that holds so much promise not only for the automotive fuel sector, but for energy independence. We speak on the floor of the House in great and grand and umbrella arching metaphors, and yet now it is time to speak of specifics.

And so, Mr. Speaker, I thank you that for this last hour I was given the opportunity to highlight a specific technology that holds so much promise, because back home at the Honeoye Falls research and development facility it can truly be said that not often in history have so few done so much for all of us.

Mr. Speaker, I yield back the balance of my time.

ENERGY

The SPEAKER pro tempore. Under the Speaker's announced policy of January 6, 2009, the gentleman from Iowa (Mr. KING) is recognized for 60 minutes.

Mr. KING of Iowa. Mr. Speaker, I am honored to have the privilege to address you here tonight on the floor of the House of Representatives. And having been privileged to listen to the gentleman before me speak of the energy issue, and not taking particular issue with the delivery that he has given nor the facts that he has such a good handle on, I would just make this point, Mr. Speaker, and that is that a little over 1 year ago, 1 year ago last August, many of us Republican Members stood on the floor of the House of Representatives and argued that we needed to expand the energy for the entire United States of America; all energy all the time.

We started that debate before the adjournment for the August recess, and the Speaker didn't want to hear the debate on energy. And so there was a motion that was delivered to adjourn abruptly, which was passed on a purely partisan vote. We kept debating energy. We were geared up to come here and debate energy 1 year ago August. And as we debated energy, the microphones were cut off, the lights were shut down, and the House of Representatives would have been cleared by order of the Speaker except we do have enough sovereignty here to bring in the citizens of the United States and our constituents. And even though Speaker PELOSI shut down the microphones, turned the C–SPAN cameras off to the side and tipped them down and dimmed the lights—didn't shut them completely off—we continued to debate energy every single business day all the way through August and into September and after Labor Day and back again.

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Our argument was not to reject hydrogen. Our argument was to expand access to all energy in America. It was the case the American people wanted. It remains the case of what the American people want, and the American people want access to all energy all the time.

We are a country that's blessed with a tremendous amount of energy. We can produce the nuclear energy that we need and more than we're using by far right now. We're blessed with a lot of coal. We have a lot of natural gas. If we would utilize the resources that we have, we could expand our ethanol, our biodiesel, our wind energy as we're doing. If we would develop the energy that we have, we would have a surplus of energy.

It strikes me as a bit odd that the gentleman would focus exclusively on hydrogen. I don't take issue with his hydrogen argument; but I will say that, as the gentleman says, if we expand our hydrogen energy instead of importing a large percentage of our energy, we will be exporting renewable energy. That is a long, long way from a reality; and we will never be to the point where we can export renewable energy unless we're willing to develop all of America's energy.

Here are some of the answers: All energy all the time. Let's drill in ANWR. Why would you leave hydrocarbons underneath Mother Earth? Why would we not go out into the gulf and drill for the natural gas and for the oil that's out there? Why would we not go up to ANWR and drill up there where we have proven on the North Slope that we can drill effectively and in an environmentally safe fashion and where the most extreme environmentalists can fly over the North Slope or walk across it or ride around on Todd Palin's snowmobile?

They couldn't find an oil well if you directed them to it because they aren't big, wooden derricks with oil bursting into the air from a gusher or a geyser. They are submersible pumps in casings that are underground, and they are wells that are drilled on permafrost, and they are roads that are accessed only during the time of the many months when there's actually frost there for them to run on ice roads. You can fly over that countryside, and you can't see the wells unless you know exactly what you're looking for.

We need to drill in ANWR. We need to drill in the Outer Continental Shelf, in all of our Outer Continental Shelf. We need to open up the leases on it. We need to drill it for oil. We need to drill it for gas. We need to expand our nuclear.

JOHN MCCAIN, in his Presidential campaign, said we need to build 45 new nuclear plants in the United States in a short period of time. Now, I don't know if that's the right number, but I