Remarks by the Honorable Ray Mabus
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All of you, I am so happy to be here and talk about what the Navy and Marine Corps are doing in energy innovation, how we are reshaping what we do and why how we do it to accomplish the mission, to assist allies, to deter potential adversaries. We've got an all-electric ship out there now and we've got two hybrids. Now, these ships are not as sleek as the Teslas being built here, but they have more optional extras – (laughter) – bigger weapons, more storage space, more passenger capacity.

And I'm going to focus on energy, obviously. But first, I'd like to give you a little context and do what I call Navy 101, about the geopolitical aspect of why are we doing this? As Ira said, we're big. A budget of $170 billion a year more or less, 900,000 people, 3.5 million acres of land, 117,000 buildings. And even in this audience, even in this area, where technology flourishes and new technologies are coming all the time, we've got some pretty advanced technology. As Ira said, we're the most formidable expeditionary fighting force the world has ever known.

And so the question is, why are we worried about energy? And in particular, why are we moving from fossil fuels to alternative energy? Well, first is because the Navy has a history of that. We moved from sail to coal in the middle of the 19th century. We moved from coal to oil at the beginning of the 20th century. We pioneered the use of nuclear for propulsion in the middle of the 20th century. And every single time we did that – every single time – there were naysayers who said we couldn't do this. You're trading one thing that's free, wind, for something that costs money, coal. Or you're giving away all those coaling stations we've invested in to move to oil. Or you can never make nuclear small enough or safe enough to put in a submarine or an aircraft carrier.

Second though is the mission of the Navy and Marine Corps is similar to that of the energy innovators in this room. We all benefit from a future where energy resources are more diverse, more available, more sustainable, more compatible with our environment. And when the Navy and Marine Corps consumes less energy and increasingly uses alternative energy, we are more expeditionary, we are more powerful, and we are more effective at our job.

In our Constitution it says that Congress has the ability to raise an army when needed, but it has the requirement to maintain a Navy. And that not-so-subtle difference is the difference in those two services. What we give the country, and we're unique in this, is presence – being in the right place not just at the right time, but all the time. Getting there faster, staying longer, bringing whatever we need with us. And because we operate from the sea off sovereign

American territory, our ships, we don't have to ask any other nation's permission to get the job done.

The way that we get this presence – I want to spend just a few minutes on these four Ps: people, platforms, power, and partnerships. And obviously I'm going to concentrate on the power part of that, but people in the Navy and Marine Corps, as here, is the bedrock of our success. We face many of the same challenges you do. Last year I announced a series of initiatives for our Sailors and our Marines. And we're aiming at attracting and retaining innovative thinkers, prioritizing merit over tenure, and providing a lot more flexible career paths. These range from promoting healthy lifestyles, to internships, educational opportunities, and improving outdated promotion systems, to increasing the number of women who enter and stay in uniform.

We've broadened our talent pool. First, in 2011, by repealing "don't ask, don't tell." And I'm going to use a technical term on you here. "Don't ask, don't tell" was just dumb. (Laughter, applause.) It didn't work. That's dumb. In 2010, I opened submarines and riverine craft to women. And last fall, we opened all billets in the Navy and Marine Corps, including SEALs and Marine ground combat to women. We made careers more viable by tripling paid maternity leave from six weeks to 18 weeks.

And in a thing that seems like a small thing, but I don't believe it is, we're moving to one uniform. Men and women wear different uniforms in the Navy and Marine Corps. If we asked any other group to wear a different uniform, can you imagine the trouble we'd be in? And it was an historical accident, because women joining the military in World War II were joining the auxiliary, so they were given different uniforms to show that they were not full active duty. The word uniform means the same – uniform. So when you look out you won't a male Sailor, female Sailor, male Marine, female Marines. You'll see United States Sailors, United States Marines.

We've done a few specifics. We've stood up a Fleet Scholar Education Program for younger officers. And this is the first year. We've got people studying at Harvard and Yale and Barnard. I brought an ROTC back to Harvard, Yale, Columbia, Princeton, after an absence of more than 40 years at all those institutions. But we also added it at Rutgers and Arizona State, two of the more diverse campuses in this country, because we need people from different backgrounds. We need people with different thought patterns. We need people who don't think and act and look at things in the same way.

We've started the Secretary of the Navy industry tours, so that we can go out and get some ideas from people like you, and then come back into the fleet with those ideas. We've got a career intermission program now. So you can take up to three years off for anything – have a family, look after a loved one, get another degree. And when you come back you owe us two years for every year you took off, but we will roll you back till you're competing against people from three years later not the ones who stayed on active duty. So your career should not suffer.

We've stood up – and this is an oxymoron – an innovation task force. Now, when you say we're going to put a task force together to be innovative, you all roll your eyes about that. But we've got the person who stood it up and who's led it now for a couple of years here with us

today, Dr. Maura Sullivan. And what we're trying to do is get any ideas that are out there in the fleet, get the creativity that is there, get it from the Sailors and Marines who are right next to the problem, and get it to the leadership. And so we've got one branch here, one branch on the East Coast. And we've done things like crowdsourcing, where people put in ideas, they get debated, and then we fund them, the ones that win.

We've got an incredible diversity of thought. I just presented the winners of these innovation awards. And they were everything. And what it's doing is instead of happening on one ship now, or at one base, we move these out and we get them to the fleet as fast as we can. A diverse force is a stronger force. If everybody thinks the same way, you're doomed to fail. You can't be a great military organization for very long. And in a democracy, the military ought to reflect the people who it defends. It just should.

And if you want a scary statistic, three out of four Americans aged 18 to 24 do not qualify for the American military – three out of four, 75 percent: obesity, didn't finish high school, a criminal record. And those are fixable things. Those are not things that are just immutable. But we're not facing them right now. And it's hurting us, the military.

Second P, platforms. In 2001, the U.S. Navy had 316 ships. By 2008, after one of the great military build-ups in our history, we were down to 278 ships. In those seven years, the Navy put 41 ships under contract – not enough to keep our fleet from shrinking and not enough to keep our shipyards open. I've been there for seven years now, longest since World War I. In my seven years, we have put 84 ships under contract, all with a smaller top line. And we did the things that you do in business, that you do as entrepreneurs every day.

We prefer a fixed-price contract. We don't design it while we're building it. If we've got a new gee-whiz technology, we'll wait until the next ship instead of trying to force it one the one that's being built today. And we negotiate hard. I signed the largest contract the Navy has ever signed two years ago – 10 Virginia-class attack submarines in five years. Each cost about $2 billion apiece. We bought nine of them, we paid $18 billion for it, and we got 10. It's like getting one of those punch cards, you buy nine subs you get the 10th one free. (Laughter.) We got 10.

And I think it's sort of funny. I've been watching these campaigns and what people are saying. Our critics are saying the Navy is way too big or way too small. It's either the smallest since World War I or we're bigger than the next 13 navies combined. Both of them are true, and they're both wrong. This is our essential role – maritime security, unimpeded global trade. If you want to know how that's important to you, 90 percent of all trade in the world goes by sea, and 95 percent of all the data that y'all do now right around the world goes under the water. It does not go by air. It goes under the water. And it's part of our job to keep those sea lanes open, both on top of the water or under the water.

Now, we do have some gee-whiz side. Couple years ago, we did what a lot of people thought was impossible. We landed a large unmanned aircraft on an aircraft carrier. We've got a whole fleet of unmanned aircraft, unmanned surface vessels, unmanned undersea vessels. We're getting new weapon systems like rail guns and lasers. And we're going to need you all's

help because those things have to have a lot of power, it has to be stored quickly, it has to discharge instantly, and then restore, because you don't want to just shoot once and let people know where you are.

We're into high-frequency microwaves. And we had a science fair at the Pentagon. And I walked around. And one of the guys said energy storage. That was on his. And I asked him, so, what did you do? He said he was working on his doctorate, and his adviser had some cow bones for some reason. And he said that he had always wondered what would happen if you put cow bones in a vacuum and you heated them to a thousand degrees centigrade. And I said, yeah, that keeps me up at night, too. (Laughter.) Well, what happens is, evidently, is a very high-grade carbon comes out of that. It's one of the densest energy storage mechanisms that we've found. And he's figured out a way to put polymers in there as well so that we're going to be using it for capacitors to store energy to be released very quickly.

Third P is partnerships. As Ira said, I go a lot of places. And I go to see Sailors and Marines where they are, instead of waiting in the Pentagon on the off chance that they'll come by and see me. I go to see allies and friends to get this network and web of navies around the world that are all working in concert. I go to see industry and our partnerships with industry. And most important partnerships are those with the American people, because the Navy and Marine Corps are America's away team. We never get a home game. People don't understand why you need a great Navy or why you need a great Marine Corps because they never see us. So reconnecting or connecting to the American people is part of that partnership.

And now, as I promised, power. Energy can and is used as a weapon. I saw this when I was a nominee for this job. It's an economic risk and it's a security risk. As Ira said, the Department of Defense is the largest single user of fossil fuels on Earth. The Navy is a little bit more than a third of that. And our overall goal that I set in 2009 was that by no later than by 2020 we would be getting at least half of all our energy from non-fossil fuel sources.

And the reason is, it makes us better war fighters. It keeps us away from supply shocks and cost shocks, price shocks. And it was costing us too much in the long run because we were losing a Marine killed or wounded for every 50 convoys of fuel we moved into Afghanistan. That's too high a price to pay. We have to have some other way to do it. So it gave us a combat advantage, but now because of climate change and because of our role, as supply changes we've got to pay even more attention to it.

So what are we doing? Onshore, the President said in his 2012 State of the Union that Navy would get half of all its energy onshore by 2020 from non-fossil fuel sources. We got there last year. We're more than 1.2 gigawatts now. We use about 2 gigawatts. And so we're just going to keep going. We blew through that. In December I announced the largest-ever purchase of renewable energy from the San Diego Western Area Power Authority. A solar array is going to power 14 of our bases in Southern Cal. Now we're beginning to look at microgrids so that we can pull ourselves off the grid in case the grid goes down. And we issued recently the largest solicitation ever for electric vehicles.

At sea today, right now, in the South China Sea the Great Green Fleet is sailing. The carrier's nuclear, but all the surface ships around it are sailing on a mixture of marine diesel and biofuels. We only have three requirements for biofuels: It's got to get a drop-in fuel. We're not changing anything. It can't take any land out of food production. And they've got to be cost-effective. And even with oil at the price it is today, it is cost-effective. In 2011, the President directed the Departments of Navy, of Energy, and Agriculture to come up with a nationwide biofuel industry. And we'll be there this year. We're investing in three biofuel plants. Each has different feedstocks. And we'll be getting, I think, about 100 million gallons a year starting in '17.

And when I get asked, well, why are you doing this, the example I give is simple. In Singapore there are two refineries. One is an oil refinery that's partly owned by the Chinese. The other is a biofuel refinery that's owned by the Finnish. I do not want to be dependent on China, or any country, for fueling our fleet. We will have options when we go to a place like Singapore.

We're also working on our efficiencies. As I said, we've got an all-electric ship out here, the USS Omaha. We've got hybrids, the Makin Island and the USS America, which have regular diesel for under 12 knots, or gas turbines for under 12 knots – before we're 12 knots, and electric engines for over 12 knots. On the Makin Island's first deployment they brought back almost half their fuel budget, and they stayed out 44 days longer than the rest of the ships that were with them.

Our Marines – and admittedly, you do not think, when you think of U.S. Marines, as ardent environmentalists – (laughter) – it's not one of the first things that springs to your mind. But they have led on this. They're doing stuff like putting very small solar panels on their packs to power radios and GPS systems. It saves a company of Marines 700 pounds of batteries, and they don't have to be resupplied.

They're doing things like wearing knee braces – because Marines walk everyday, and if they see a hill, whether they need to or not, they walk up it. (Laughter.) But they're using that energy from the knee-braces to power stuff. They're using that kinetic energy. And so they're producing power where they are. We have SEAL teams in the field that are getting very close to net zero in terms of power and water. They use solar and wind to purify water. So they can stay out almost indefinitely, needing only occasionally a supply of food.

So we're doing it because it makes us better at our jobs. But there's also climate change. Very few see and feel the effects of climate change like our Sailors and Marines. A month ago right now I was in the Arctic. I was on a submarine and they went through the ice at the North Pole. The ice wasn't that thick. We had to have somebody out in front of us as we were walking around - and it was 50 below – with a prod, to make sure the ice was thick enough to hold us. That's where you can see it.

And the northern routes are now at ice free in the summer. And with those opening of those routes, with the opening, our Navy – it's going to be ice free in the summer probably very soon – our responsibilities go up, because those are international sea lanes. But some countries

don't believe that. And part of our job is to keep those open. And also, we have a lot of competition for minerals, more fish, for everything under the sea.

At home our bases are mostly on the water, right? It's the easiest way to get ships in. They're beginning to be threatened by rising sea levels. So we could lose some of our big bases if sea levels keep rising at the rate that it looks like they're estimated to. Our use of fossil fuels, scientifically proven, were the causes climate change. That's a national and international security issue. Some of the examples – and we're going to have an existential event. We're going to lose a nation in the Pacific. It's just going to go under water – Kiribati, an island nation.

Yesterday it was announced for the first time the Federal government was giving a grant to move an entire town because of rising sea levels from climate change -- $48 million to the Isle de Jean Charles, Louisiana. And more important and significant, these were America's first climate refugees. These people have been living there for generations, for centuries. Most of them Native Americans. As they leave, they're leaving behind their heritage, they're leaving behind everything. And so that ought to get people's attention.

If you like politics, Estonia is the one country I'm aware of that's had a full-scale cyberattack from Russia. It almost brought down their banking system. And they were worried about their electrical grid and trying to get other sources of power. Lithuania had to shut down its own nuclear reactor, because it was a Chernobyl design from the Soviet era, in order to get into the EU. In Greenland, as ice melts, the search for oil ramps up. And this is an incredibly fragile environment. And we saw what happened at Deepwater Horizon here. We are much more resilient. We have piracy in the Gulf of Guinea, off West Africa, that – because offshore oil. So you're seeing rising levels of piracy and transnational crime. Jordan relies on a pipeline from Egypt that gets blown up all the time by terrorists.

And when there's a crisis, the U.S. military, usually the Navy and Marine Corps, are called upon. So we've got to act. The military often leads the way. And things that started in the military are GPS, Internet, flat-screen TVs. I just announced three weeks ago down the road here that we're joining the Carbon Disclosure Project. We're asking our biggest suppliers to put forward their carbon footprint and what they're doing. So we have to do something. And together, we can. The old Saudi oil minister from the '80s, Zaki Yamani, said one time: The Stone Age didn't end because we ran out of stones. It ended when we invented something better. And that's what you're doing. You're inventing that something better.

And I'm going to end as I began. The efforts of the Navy or Marine Corps to increase reliance on alternative and reduce overall consumption has made us less vulnerable to price shocks and supply shocks. It has increased our reach. It has made us more expeditionary. So the world's most powerful force is even more effective at maintaining or, when it's necessary, restoring the peace. Our efforts, like all of you here, all of the innovators in this room and the innovators around the world, are aimed at creating a future where energy sources are more diverse, more available, more sustainable, more compatible with the environment. But what that means is a much more stable and a much more secure world for all of us.

So from the Navy, Semper Fortis, Always Courageous. From the Marines, Semper Fidelis, Always Faithful. Thank you all very much.