

U.S. Navy Secretary Ray Mabus

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Greg Dalton: Welcome to Climate One, a conversation about America's energy, economy and environment. To understand any of them, we have to understand them all. I'm Greg Dalton. And today we're talking with US Secretary of the Navy, Ray Mabus, about powering America's economy and military.

The oil boom in North Dakota and Texas has projected to make the United States the world's largest petroleum producer next year. The notion that we would extract more oil than Saudi Arabia would have been unthinkable just a few years ago. While the country is awash in newly available oil, burning that oil is disrupting the earth's climate and driving weird weather. If the world doesn't reduce carbon pollution soon, scientists say we can expect more severe droughts, floods and economic disruption.

Over the next hour we'll discuss what the US Navy is doing to balance the country's needs for energy and security while also confronting climate reality. Along the road, we will include questions from our live audience here at the Commonwealth Club of California.

Ray Mabus was governor of Mississippi for four years and US ambassador to Saudi Arabia under President Clinton. President Obama appointed him US Secretary of the Navy in 2009. Please welcome Secretary Mabus to the Commonwealth Club.

[Applause]

Secretary Mabus, welcome.

Ray Mabus: Thank you. I'm glad to be here, Greg.

Greg Dalton: I'd like to start in 2012, there was a demonstration of something that's called the Great Green Fleet. So tell us what that was and why you're doing it?

Ray Mabus: The Great Green Fleet is a Carrier Strike Group that was involved in The Rim of the Pacific Exercise which is the biggest naval exercise in the world every two years. And it was a nuclear powered aircraft carrier and its screening ships, a cruiser, several destroyers in misnamed order. Every service ship was steaming on a mixture of marine diesel and biofuel. Every type of aircraft it took off from the carrier was flying on a 50/50 mixture of aviation gasoline and biofuel. We did it to demonstrate that we can reach both afloat and ashore the Navy's goal that we set that by no later than 2020, at least half of all Navy energy, both on our ships at sea, our aircraft in the air and our bases will come from non-fossil fuel sources.

The big news about it was there was no news. We bought the biofuel, put it in the normal supply chain. It got to, as I said, a misnamed order. It was filled with biofuel. We refueled it in the air, we refueled at sea, and the planes didn't notice the difference, the ship didn't notice the difference. There was no difference in that and their normal exercises, their normal steaming. And so it shows it works. And we're going to deploy the Great Green Fleet for seven or eight months in 2016.

Greg Dalton: Did you actually fly in one of those jets, flying on biofuel?

Ray Mabus: I flew in a helicopter running on biofuels. And I signed an agreement with the Australian Navy on the Nimitz, on the carrier. We are trading information with Australia and certification information on our planes and our ships. And the vice chief of the Australian Navy signed it. And one of the reporters said, "Are you committed to this program? How committed are you?" And he said, "I'm about to get on that helicopter that just got refueled with biofuels. I'm

pretty committed to this whole thing.”

Greg Dalton: I actually heard there's actually 1 percent performance increase, that biofuel is actually better than the old stuff.

Ray Mabus: It burns a little cleaner. And so there's a little more power and it then doesn't bunk up your engine quite as much.

Greg Dalton: In September of 2013, a couple of analysts at the Heritage Foundation wrote a piece called Biofuel Blender. And they questioned the Great Green Fleet saying that biofuels are being purchased by the Navy for \$26 a gallon compared to \$4 a gallon for diesel. They said diesel will be plentiful partly because of fracking. And so how would you address concerns about the cost and critics of the Great Green Fleet?

Ray Mabus: I would address it this way: Yes, we pay \$26 a gallon for the biofuels for the Great Green Fleet that was because we bought a very small amount for a demonstration project. Now, the very first biofuels we bought to test an aircraft in 2009-2010 cost 10 times that because it just wasn't a market and you're buying sort of experimental amounts. We have under a law called the Defense Production Act which says that if you need something for defense that's not produce in scale, you can invest in it.

And so we have four companies now, four biofuel companies, all using different technology, under contract beginning in 2016 to produce 170 million gallons of biofuel a year at far less than \$4 a gallon and it's going to be very competitive with fossil fuels. In fact, we're not going to do it unless it is competitive with fossil fuels but what we do is we bring a market. The Department of Defense is the biggest user of fossil fuels in the world. The US Navy is about a third of that. So we burn, in the Navy and Marine Corps, about 1 percent of all fossil fuels burned in the United States every year. We can bring a market. We can make it economical. We can bring the scale to this. And we're doing it for one reason. We're doing it to be better war fighters. We're doing it for national security reasons.

And I'm glad that US is producing more and becoming more efficient at getting some of the energy that we have. What it doesn't do for us though, number one, we can't use natural gas at sea because we got the engines and the aircraft and the ships that we're going to have. I mean, we got most of the fleet that we're going to have in 2020. We've got most of the aircraft we're going to have in 2020, and they burn aviation gasoline and marine diesel. But number two is the ultimate global commodity. And the price goes up and down based on completely strenuous factors.

Syria is not a big producer of oil and gas. When the unrest started in Syria, price of oil went up almost \$10 a barrel. For every dollar the price of oil goes up, it cost the US Navy an additional \$30 million a year. In FY-11 and FY-12, we had an extra \$2 billion in fuel bills, unbudgeted, because of the volatility of the price of oil. And we have got to erase that volatility. We've got to do it with a homegrown source. We're not just doing it with biofuels. Biofuel is one part of the effort. We're doing it with solar. We're doing it with wind. We're doing it geothermal. We're doing with hydrothermal. We're doing it in any way that we can to take us out of this price box that are hindering our ability because even in the Pentagon, \$2 billion is a lot of money.

In the Pentagon, at large, over that same two-year period, had a \$5 billion unbudgeted fuel bill because the price of oil went up quicker than anybody had anticipated. The only place I have to go get that money is exercise, operations, maintenance, so we fly less, we steam less, we train less or if the bill gets too big, you have to go out of the platforms. You buy fewer ships, you buy fewer aircrafts.

I don't think either one of those is a good option. I think you ought to have a third option and that is get your fuel in a different way, buy it in a different way, use it in a different way from a different source. And I am absolutely convinced that we are going to meet this 50 percent goal by 2020 because of the ingenuity of American science because of the partnership we have with the Department of Agriculture, with American farmers in biofuel, because of the partnership we have

with private industry and things like solar and wind. And it all goes to one thing. What the Navy and Marine Corps give America is presence. We are there all the time. We're not just in the right place at the right time. We're in the right place all the time, and we have to be. We're the only global navy in the world.

We were there when the Philippines had their humanitarian assistance. The Marines were there less than 24 hours later because we were already there. When Syria erupted, our ships were already in the Eastern Mit because we were there. And what we have to have from fuel is the ability to give that presence. And if the price is that volatile, and sometimes if the supply is that volatile, we begin to lose our ability to do that.

Greg Dalton: Some advocates of American Energy Independence would say we can have that supply from North Dakota and Texas and not buy from Saudi Arabia and other unfriendly nations. But if I understood you correctly, that supply independence but not price independence because the price is still set by the global market.

Ray Mabus: Exactly. Supply independence is one thing. Price independence is something else entirely. I think you can get much closer price independence with things like solar or wind or biofuels than you can with a completely global commodity. And all traders talk about it in terms of a security premium. When Libya went up, again, not a big a producer, a producer but not a big producer, the price of oil spiked. Every time some extremist group threatens to close the straight four moves, just threatens, there goes the price of oil. And we have got to tamp down that price volatility because it's a real military vulnerability for us.

Greg Dalton: I just want to clarify what you said earlier that now or in the near future, the biofuels that the Navy is purchasing are cheaper than petroleum.

Ray Mabus: Well, I think they will be very competitive with petroleum. What I said that we've got contracts with four companies for less than \$4 a gallon starting in 2016 for 170 million gallons a year. I don't know what petroleum is going to be at that point, but right now it's exactly in the same range as petroleum.

Greg Dalton: The defense budget is set to decline due to the sequester and some recent laws passed. So, how is the budget environment for the Pentagon affecting these efforts to bring in new technologies, some of which cost a little more?

Ray Mabus: Well, I think it makes it even more imperative that we do this because the budget is shrinking, and I think the American people have a right to insist that our military budget shrinks. We're coming out of two wars. We ought to spend less on defense. We ought to do it smartly.

Greg Dalton: And it's doubled since 9/11 already so...

Ray Mabus: I mean, I'm going to put in a Navy poetic here. On 9/11/2001, the US Navy had 316 ships. By 2008, after one of the great military buildups in American history, we were down to 278 ships. We had 49,000 fewer sailors in that time. In the four years before I became secretary, the US Navy put 19 ships under contract. In the first four years I was secretary, we put 60 ships under contract with a smaller pipeline. And I've got to power those ships. The quantity becomes a quality on its own.

And if we're going to be a global navy, we have to have those big gray holes out on the horizon. And if we don't do it in this time of shrinking budgets and we continue to have these price spikes, that's going to impact the ability to build these ships, that's going to impact the ability to build aircraft, that's going to impact the ability to train, that's going to impact the ability to be forward deployed, to be where we need to be. Now is exactly the time that we have to do this. A tightening budget situation makes it even more urgent, even more critical that we do this.

Greg Dalton: Let's talk about those price spikes because agriculture commodities can also be volatile. We've seen in corn that the price of corn has gone up as there have been mandates to put

corn into fuel. So where is the guarantee that when you start making out of camelina or jatropha or daisies, whatever it is that the prices won't spike for those feedstocks?

Ray Mabus: Well, number one is competition. I think competition is a pretty good thing. And that you ought to have competition between different fuel prices, between different fuel types. Number two, we don't have many rules in terms of what we will buy, for example, I'm biofuels but we do have some.

Number one, it can't take land out of food production. Number two, it has to be a drop-in fuel so that we don't have to change our engines in any way. We just put the fuel in. And number three, as I said, biofuel is only part of this big effort.

So as you're seeing the price of solar come down now in the United States and becoming much more stable, you're seeing the price of wind come down in the US, the as these new technologies and as we bring this market for them, and pretty technology -- I don't have a favorite technology.

Greg Dalton: Agnostic, yes.

Ray Mabus: Yes.

Greg Dalton: There are lots of people in Silicon Valley that would like to say something on some of those.

Ray Mabus: The four companies we have contracts with in the biofuel industry all use different feedstock, every single one of them, and they're wildly different, and as long as it produces the fuel. And I think that's one of the ways that you begin to tamp down that volatility because unlike if you just single out corn, then yes, you may have -- I mean, I'm from Mississippi. All sorts of people started planting corn when it became mandated for fuel. But it's got to be economical in its own terms for farmers.

And Tom Vilsack, the Secretary of Agriculture who I understand spoke here in a not too distant past, he announced "I think I'll farm the fleet which is going to help move those agricultural products to bio refineries to the fleet." We bring the market, he brings agriculture, and the American farmers bring the product. And I think that's a way you tamp down the volatility and I also think it's a way you produce American jobs.

And you help the economy because if you look toward the future, a clean energy economy I think is the future. And if we can help speed it up, and the military has done that in instance after instance after instance. I mean look at GPS, look at the internet, look at flat screen TVs, the military was the first to do that in every single case because it helped us militarily, and this will help us militarily.

Greg Dalton: And hasn't the Navy also encountered resistance every fuel change it's made in its history?

Ray Mabus: One of the things I do -- I get asked a lot "Why is the Navy doing this? Why is the Department of Energy doing this?" And we're working very closely with the Department of Energy. But it's one of our core competencies, changing energy. We went from sail to coal in the middle of the 1800's. We changed from coal to oil early in the 20th Century. We pioneered nuclear as a form of transportation in the mid 50's. Every single time there were naysayers. Every single time people said, "It's not going to work. It's more expensive." I mean, the wind is free. What do you mean you're going to buy coal? And then you had a whole thing of coaling stations set up around the world. We changed. We went to oil. You can never make nuclear small enough or safe enough to do this. If cost was the only thing, we'd all still be using typewriters.

Computers are still more expensive than typewriters. Rotary phones are still cheaper than smart phones. Nuclear powered aircraft carriers or submarines are still more expensive than conventionally powered. It gives an edge though. It gives us an edge, and it's an edge I don't think we can afford to lose. And so, that's been right in our wheelhouse throughout, virtually, the whole

history of the Navy.

And people that joined the Navy, people that joined the Marine Corps have this willingness to change or willingness to want to see what's over the horizon, willingness that they want to go, and it's truly true joining the Navy or the Marine Corps, see the world. And that is a part of the spirit to innovation, the spirit of change, and that's one of the reasons the Navy has been at the forefront every single time we've had that sort of change.

Greg Dalton: What are other navies around the world, now that China's taking grease out of its wax and putting it into their aircraft carriers, I mean where are other countries on this conversion to non-fossil fuels?

Ray Mabus: Well, number one, they're all watching us very, very closely to see if we can do it. Number two, we have some good partners around the world. Australia is a very good partner. As I said, we're sharing information with them, and they are pretty forward down the line. Italy is pretty forward down the line in terms of some of these alternative fuels. China, not necessarily militarily but is pouring money into alternative energy. And interestingly enough, the country that you mentioned first where I was ambassador to, Saudi Arabia, is one of the largest spenders on alternative energy in the world. That ought to tell you something.

Number one, the Saudis have figured out that they make more money if they sell their oil than if they use it internally. But number two, they are cognizant that someday they're going to need something else so they're putting money into nuclear, they're putting money in the solar, they're putting into other things beside just fossil fuels.

Greg Dalton: Some people believe that the fracking boom in the United States and other countries will actually challenge Saudi Arabia's dominance and challenge OPEC and the oil market. Is that true?

Ray Mabus: Well, whether it does or not, again, you go back to the fundamental truth that oil is a global commodity and that regardless of where it's produced, a lot of times it's traded on rumor and speculation. And that's what we're trying to tamp down. I mean, I would like to have a completely US source of energy. And very frankly, the military can get even today or 10 years ago, if we need the fossil fuels, we will get it. We're first in line. But it's these wild price swings that's hurting us. And the Secretary of the Navy not only has the Navy but we've got the Marine Corps. And we're talking about saving marine lives doing this.

In Afghanistan, the height of the fighting, for every 50 convoys that came into Afghanistan we lost a marine, killed or wounded. Now, most of those convoys were carrying one of two things; fuel or water. And that is too high a price to pay. We've changed things. Former Secretary of State, George Shultz, came to the bin I was at in 2013, and he brought with him a solar blanket that we had issued to marines.

George Shultz is a marine, '42 to '45 in the artillery. And he had the solar blanket. We gave it to marines in Sangin, in the middle of some of the heaviest fighting there. It saved an average Marine company 700 pounds of batteries. You could plug your GPS into it, plug your radio into it, roll it up, stick it in your pack. The technology has moved passed that now to where it's lighter, it's smaller.

But if you can produce energy where you use it as a marine, you're going to save some lives, you're going to be a more effective fighting force.

We have SEAL teams that we deploy that are getting pretty close to net zero in terms of energy production and water production so they never have to be re-supplied which is a huge military advantage. And when you turn off a generator, a SEAL told me this, he said, "Yes. One of the other advantages is we used to have these big old generators," and said, "It was like painting a bulls eye on us. Go to the noise."

Greg Dalton: And the heat.

Ray Mabus: And he said, "Turn it off, and all of a sudden you can hear when somebody is sneaking up on you. All of a sudden, you're not this big target." So there are sorts of military reasons to do this, and that, as I said, is the reason that we're doing it. There are some great side effects. Lowering your carbon footprint, climate change, things like that that I'm very proud that we are trying to be a good steward of the environment but the main reason we're doing it is because of our main job, and that is to be a great military force to protect this country.

Greg Dalton: If you're just joining us, our guest today at the Commonwealth Club is US Secretary of the Navy, Ray Mabus. I'm Greg Dalton. Let's talk about impacts on the Navy and the country from climate change. Norfolk is one of the largest Navy bases in the world, and it also is located in a town that had some issues with climate change. How is ship-building in the Navy bases affected by storm surge and sea level rise, and what are you doing about that?

Ray Mabus: Obviously, the Navy is big in coastal areas. And so we are very aware of sea level rise for the reasons that you mentioned, but it's not only that. A large majority of the people on earth live within a very short distance of the shore. And as sea levels rise, it can trigger instability around the world. And when that happens, the first responders, the forces called up whether it's for humanitarian assistance, disaster relief or whether it's in the case of some sort of crisis, is the US Navy, the US Marine Corps. So our responsibilities get bigger, our area of operation get bigger, our job becomes more complex.

You're seeing what's happening in the Arctic. Suddenly the Arctic is becoming ice-free, at least along some of the channels during the summer. It's causing competition for resources there. It's causing competition among countries there. It's causing more ships to go through there.

Sometimes those ships aren't prepared so you're going to have more risk, more risk of spill, more risk of sinking, more risk of having to do search and rescue.

So our responsibilities, our jobs become bigger because of sea level rise, because of some of these things. I was in Carrabas in the South Pacific because we do a thing called Pacific Partnership with them, and with a lot of the hours there. The president of that country is afraid his country is going to disappear.

Greg Dalton: I was going to ask you if you've met President Nasheed from the Maldives who was on the David Letterman Show in 2012. I recommend going back to look at this. You may think, "Oh, Maldives. Never heard of it." What happens in the Maldives can happen here in Manhattan. This was six months before Super Storm Sandy brought the Atlantic Ocean into the New York subway. So, what he predicted exactly happened. So, I was just wondering if you've met him or the people that are going to lose their countries in the Pacific.

Ray Mabus: Well, as I said, one of the things that I try to do when I'm traveling, particularly to the Pacific, is go to places that we do Pacific Partnership. And Pacific Partnership is when we send a ship in, sometimes in partnership with other countries, usually in partnership with non-governmental organizations. We do medical, we do dental, we do veterinary but we also train the local military, we train the navy, we train the coast guard, our marines train ground forces.

I have visited a number of these countries. And the concern there is palpable -- I mean Carrabas is an average of about I think two meters above, or less, above sea level, and they don't have to have much change to just disappear. And one of the initiatives he's pushing is getting people to move, getting people to leave his country. That's pretty serious.

And again, I'll go back to -- I'm a native of Mississippi. I lived through Katrina And some of these super storms that are beginning to hit. My daughter, Annie, goes to NYU and had to be evacuated during Sandy. So this can happen anywhere and it's personal. It's not happening to the Maldives, it's not happening in Carracas, it's happening here, and it's something that we disregard at our peril.

Greg Dalton: The New York Times recently ran a story about Secretary of State, John Kerry, making a push toward global climate deal in 2015. There's a big summit planned in Paris. Senator

McCain was quoted saying, "Nothing is going to happen in the US Senate in the foreseeable future."
Senator McCain used to be a champion of climate action. What do you see as the prospects for a global deal on climate in 2015?

Ray Mabus: A large part of my career has been in politics. And when I ran my first race, one piece of advice that I got that stuck with is don't answer speculative questions. I don't know, and I'm not sure if anybody does. I'm not trying to be flip here. I think that people know that climate change is real, people know that it's accelerating, that there are real consequences of it. But what I'm trying to do in the job that I have with the Navy, with the Marine Corps is take the purchasing power that we have, take the market that we bring, and help move us, and by extension, the country, into a cleaner energy future, into a lower carbon energy future.

And by doing that, I hope you can begin to address some of the issues that you just talked about.

Greg Dalton: You mentioned the Arctic earlier. Let's go back to that. I mean, why should we care about an ice-free Arctic? What does that mean? For us it means something just like we can get goods from Europe faster through the Northwest Passage. But what does the concern about an ice-free Arctic?

Ray Mabus: Well, for one thing, sea level rise because if ice doesn't go away, it becomes water, and you're looking at sea level rise. For a second thing, the countries that border the Arctic, and there are five of them, and some of countries that don't -- China just announced a deal with Iceland and are very interested in it because it's evidently what people think and probably with good reason that there are trove of minerals there that have been unreachable. So you've got that expiration for that and all the good things but also all the bad things that happen with that. The possibility of oil spills, the possibility of wrecks, the possibility of an ecological disaster that goes on there. When you begin to have merchant ships, which you said, coming through in favor of northwest passage now. Again, Russia has said that that passage that's open now is theirs, that it is not an international transit zone, it's an internal passage for Russia.

And so you up the potential for friction. You up the potential a dispute over minerals, over borders, who has what. We're the only country that hadn't signed the Law of the Sea Treaty. So our claims to the Arctic, and that we are an Arctic nation, rest on much less firm legal grounds than the other Arctic countries. So we ought to care about whether the Arctic is becoming ice-free. We ought to care about the temperature rise that's causing that to happen. We ought to care about the consequences that will inevitably flow whether it's instability, whether it's more friction, whether it's natural disasters that could happen. But as Secretary of the Navy, I've got to be concerned about it because it, again, increases our area of responsibility. It increases what we have to do and what we have to train to do.

Greg Dalton: We have ice breakers. Well, you don't need ice breakers, I suppose. But if the Navy doesn't have to protect supply routes of oil from the Middle East, doesn't that free up resources to do other things?

Ray Mabus: Well, we are protecting all lands in the Middle East even though we get very little of that oil. You can make a pretty good argument that one of the main reasons Asia is rising is the United States Navy.

Greg Dalton: Protecting the oil supply.

Ray Mabus: Protecting that but also protecting sea lanes around the world, protecting the Straits of Melacca through which more than half the world's goods and oil flows through this one little strait there with Singapore, Malaysia and Indonesia.

We have been, and for the first time in history, as a dominant naval power, we've kept the sea lanes open for everybody engaged in peaceful commerce. Most of the time if a country became dominant, they protected it for their ships. We have opened it for everybody. And you can argue that the rise in the economies of Asia because 95 percent of all goods in the world flow across the

ocean, 95 percent of all telecommunications goes under the ocean. And so, even if you live in a land locked country, the stuff you get has come somewhere by sea. And the fact that the US Navy has kept those sea lanes and those choke points open for everybody has been a very powerful driving force in the world economy, not just for our economy but for the world's economy. We don't pick and choose what we protect right now. We protect the world. And in doing so, I think the United States and our citizens and our economy pretty well.

Greg Dalton: If you're just joining us, our guest today at the Commonwealth Club is US Secretary of the Navy, Ray Mabus. I'm Greg Dalton. Let's talk about technology. You talked about the Military and the Navy as a market for technology but also creating technology. So what cool technologies are you working on in the Navy? One person earlier talked about using grease from the fried chicken on ships to power the engines. I mean, what kinds of things -- or harvesting energy from the oceans. What things excite you?

Ray Mabus: We're working on so many cool technologies, some of which I can tell you about. One of the things that the Navy got a patent on that was announced and didn't get much play is one of very smart or several of our very smart scientists from the Office of Naval Research came up with a way to create fuel by combining organic matter and seawater.

For example, an unmanned vehicle using this technology and starts running low on fuel goes to the bottom of the ocean which is pretty rich in organic material, scoops up some, there are seawater all around, mixes it together and suddenly it's got fuel again. And so that unmanned vehicle can stay out perhaps indefinitely, or certainly for a long, long period of time, doing the nation's business.

The Marine solar blankets that I talked about. There's a technology now that instead of having a three foot by three foot, fairly thick blanket that you roll up that's really a solar panel, that will produce the same amount of power on a thing the size of a sheet of paper, and it's transparent and you can roll it up. They grow it one molecule at a time. That's the technology. Private sector is inventing all sorts of things like this. And the Navy is doing some of the same thing whether it's new types of fuel cells, whether it's new ways of doing this, whether it's the sorts of energy things. Again, we have been on the cutting edge of technological innovation in the country.

I'll go back to the reason flat screen TVs were invented; we needed a way for the military to have this very clear visual without taking up a whole lot of room. Well, that's spread pretty far. And these sorts of things can start in the military for purely military applications and move very quickly into the civilian world and profoundly change as the Internet has profoundly changed the way we do business, the way we act, the way we react as a society.

Greg Dalton: But sometimes when government creates new technology or makes bets that turn out badly, Solyndra, et cetera, taxpayers get upset and it gets very political. So is it the right place for government taking technology risk and doing those kinds of things or is it better done in the private sector and you're a buyer?

Ray Mabus: Well, I think you do it as a partnership. I mean, we have great partners in the private sector, in universities. We do a lot of research. A lot of researches are done on our behalf through universities. Private industry does far more research than we do. And I would argue that we're not making a bet. We're not picking winners and losers. What we're doing is trying to change an economy. What we're doing is trying to change the way we get fuel. We don't have one way to do that. We don't have a technology that we say, "There, you're it." One of the problems government has had is just your point.

I showed as an ambassador to Saudi Arabia in 1994. Sitting on my desk was a state of the art Wang computer. Now, Wang had been out of business in 1994 for about six years because the government would buy hardware, but it takes a long time to buy stuff in the government. It takes forever to buy stuff in the government. And so by the time that shiny and new hardware would get there, technology had way passed it by and nobody in the private sector would do stuff like that.

And so we've got to be sort of, in your phrase, technology agnostic. All we want are the results. All

we want is to be able to do things and not lock ourselves into one specific way. And that goes back to my competition argument. I think competition is good no matter what it is. In our ship-building programs, one of the ways we manage to build so many more ships is we've made people compete. And it's sort of like magic. The prices come down pretty fast.

Greg Dalton: So you compete even with the Army and Air Force? That's okay?

Ray Mabus: I think that's a great competition, and I'm being very serious. I think that the competition on things like energy with Army and Air Force is a good competition. And I think the results are going to be pretty much the same as Army and Navy football which Navy has now won for 12 years in a row. [Laughter]

Greg Dalton: We already hear. Our guest today is US Secretary of the Navy, Ray Mabus. How do you manage your personal carbon footprint?

Ray Mabus: Well, I moved from a big old rambling house in Mississippi to a little bitty townhouse in Washington D.C. because that was all I could afford [laughter].

It's one way that I do it. I ride around in one of those big black SUVs that the government mandates for people in my position with my security detail but it's a hybrid vehicle. We do that. We do flex-fuel stuff. And the Navy aircraft I have flown is a lot of times powered by biofuel. I have three daughters, 23, 21 and 12. I've been unable to get them to get off their cell phones or not want to go as much or anything like that. But I do think there's a goodness to not only thinking globally but also acting locally.

Greg Dalton: We're going to invite your participation for questions with Secretary Mabus. Line starts over there for audience questions with our producer, Jane Ann. So if you're on this side, please go through those doors and around there, and the line will start over there. We welcome your one part question or comment. I'm here to keep you on time and on target. Our guest today at Climate One at the Commonwealth Club is US Secretary of the Navy, Ray Mabus. I'm Greg Dalton. Let's have our first audience question. Welcome.

Peter Jussila: Secretary Mabus, I am Peter Jussila, a Vietnam veteran, who Twittered you my question this morning. I hope you have an answer now or in the near future. President Obama on July 15, 2013 signed a memorandum for the heads of executive departments and agencies on the subject expanding national service through partnerships to advance government priorities.

It created a taskforce listing DoD at the top of the list. The agree requested DoD feedback within 180 days regarding its outlined missions. My question is, can you name the DoD representative who's on this task force, if not, provide me contact info in the near future?

Ray Mabus: I can do number two. And the contact information is sitting in the front row here.

Greg Dalton: Let's have our audience question for Secretary Mabus.

Male Participant 1: Good evening, Secretary. You mentioned that you thought or you felt like people acknowledge that global warming is a real thing, we're at that point but it seems that one of major political parties refuses to agree with that sentiment. And I'm just wondering since they have a major say over the defense spending and the budget, how much pushback have you gotten as far as the purchasing of bio diesel and moving in this direction?

Ray Mabus: We've gotten some fairly significant pushback. I have been sort of honored by the pushback. What it says to me is what we're doing is working, that they wouldn't be paying much attention to Navy if what we were doing is just out there playing around. But having said that, an amendment in 2012, in May of 2012, an amendment was passed through the Senate Armed Services Committee to basically shut down our biofuel program. And it was passed because a couple of folks that were on our side weren't there. They got called away. When it came time on the floor, the first amendment that was allowed was an amendment to strip this out, to remove this

prohibition, to allow Navy to go forward with the biofuel.

We got 62 votes for that including 12 Republicans. This is not a partisan issue. I have one of the last nonpartisan jobs in Washington. The people who voted to allow us to continue did so because, number one, they knew it was working, number two, it was good for our economy, number three, it helped things like farm states and farmers, but over all they also knew it helped our national defense. And I think that that is one of the most powerful arguments that you can make. And the only argument that was left was cost and that we've, I think, taken it off the table.

Greg Dalton: Let's have our next question for Secretary Mabus.

Male Participant 2: Mr. Secretary, you have been so active during your tenure here. How much longer will you remain the Secretary of the Navy? And also congratulations on bringing Admiral Dennis McGinn into the Department of Navy but I would like to know how long you're going to be around. I wish for a long time.

Ray Mabus: Do you know something I don't know? [Laughter]

Male Participant 2: No, sir. It's just four, five years usually runs the -- Secretary Shultz, he stays longer, of course. [Laughter]

Ray Mabus: I love this job. I think I've had the two best jobs in American government. The best elected job as governor and the best appointed job in this. And I work at the pleasure of the President but as long as he let me stay, I'm very happy doing it.

[Applause]

Greg Dalton: Let's have our next question for US Secretary of the Navy, Ray Mabus.

Male Participant 3: Good evening, Mr. Secretary. I'm an enlisted member, actually, of the Navy. I see all these educated people here however I feel that there is a bit of a disconnect between these environmental friendly policies and some of the enlisted members of the Navy. And I was wondering if you had any educational or outreach programs for enlisted members, people who may or may not be college educated or may just have a very specific one world view of a topic of this nature.

Ray Mabus: Number one, yes, there are a lot of some of these outreach programs in the training that we're now including that has some bearing on energy. But let me give you one specific example. Some of our best ideas come from the petty officer third class that's in the engine room. The USS Makin Island is the Navy's first hybrid ship. It's a big deck amphibious ship, big ship. It has an electric drive for speeds under 12 knots and a normal diesel for speeds over 12 knots.

It turns out warships go under 12 knots a lot. And on his last deployment which was about a seven-month deployment to the central command to the Middle East, we had a \$35 million budget, fuel budget, for that ship. They saved \$17 million of it.

[Applause]

And part of it was the hybrid drive but I went and visited Makin Island and the engineering officer said, "Yes, part of it is this hybrid drive. And I'm proud of that." He said, "But the thing I'm prouder of are the sailors on this ship now know that this makes them better war fighters."

And so, a second class petty officer will come up and say, "I have figured out a way that I can save energy on this. I have figured out a way I can save energy on that." At the Rim of the Pacific for the Great Green Fleet, I went over to the cruiser Princeton. They've got two Hilo Hangars near the stern. One of them has LED lighting. The other one doesn't. The crew now will not repair a Hilo and the one that doesn't have LED lighting because you can't see as well. And the only way you can change those light bulbs because the overhead is 30 feet above the deck, is put some

scaffolding up. You only have to change LEDs about every seven years. You have to change the incandescent stuff about every six months. So the enlisted sailors who were having to climb up on those scaffolds and doing it or who were having to repair helicopters in less than ideal conditions -- I mean, it's hard enough repairing on Hilo on a pitching ship at sea and the lighting are not good enough. And they have figured out if you change all the light bulbs, put LEDs in, you save 1 or 2 percent of the total fuel bill of that ship.

That's pretty powerful and that's where some of our best ideas are coming from, is from the ranks, from the third class, second class, first class petty officers, the chiefs that are doing it everyday and seeing the results everyday. And I hope that -- I think that's the way you make real change is from the ground up and not from somebody like me saying we ought to be green.

Greg Dalton: Let's have our next question for Secretary Mabus.

Male Participant 4: Secretary Mabus, I'm very happy to hear that the Navy is replacing all the petroleum based fuels with biofuels. I think you're the globe's largest user of bio diesel. What I'd like to ask however is what's happening with the hardware especially because you grew up in a hardware store in Mississippi. Are there any examples of changing the hardware like the vessels, the equipment, and buildings where the fuel is being replaced? Are there examples of reducing the waste of energy or energy efficiency? I'm curious about those.

Ray Mabus: And that is my fault. I should have mentioned that because energy efficiency is one of the main ways -- we're going to use less energy, and we're going to use a different kind when we do it but using less, and we're doing all sorts of things. Hole coding cuts the fuel usage on a ship by a couple of percentage points. Putting stern flaps behind the screws cuts fuel consumption. Voyage planning cuts fuel consumption. It goes back to the age of sail. Know where the currents are, know where the wind is instead of just telling a captain in San Diego "Go to Japan," go this way. Follow these currents. You will save that.

We've been working with large shipping companies like Maersk that now pay their captains partly on how much fuel they use. And they can do it regardless of what size of the ship is, regardless of what kind of cargo its carrying. And we're trying to learn some lessons from that. On shore we're building a lot more energy efficient buildings.

The Deputy Undersecretary of the Navy came from the Green Building Council. And so we're putting some of those things into use. We've got smart grids almost everywhere now in our bases so we know where we're using our energy. When I first started this -- and you can sort of tell if your message is getting through by the kind of briefings you get because when I was first Secretary, and I'd go out to bases or ships, I'd get briefed on everything. Now the first thing they talk about is energy. Now, I know they're doing it because of me but one of the bases commanders said, "When I knew you were coming, I got a copy of my electric bill," and he showed it to me. Eighty-five percent was something called line loss. He said, "I don't know where that electricity went. I don't know which building used it. I don't know where I can save." He said, "I'm going to put smart meters."

That's how the Navy used our stimulus money was to put smart meters in a lot of places. So now we know what buildings our energy holds. Now we know what we can do. Now we know where the peaks are and things like that. We're looking into things like microgrids so that we can off the grid or we can use the grid as a backup not only to save energy but also if something, God forbid, happens to the grid, we need to still be able to do our military responsibilities. We need to have that power so that we can operate. So we're doing stuff like that. We're buying different vehicles. And the Navy has 50,000 non-combat vehicle fleet. Just by changing what we're buying -- buying more flex-fuels, buying more electric vehicles -- we're reducing the amount of fuel that we use.

I could prattle on all night about these sorts of things, but we really are, I think, being far, far more energy efficient. And there are ways to go. There's still a lot of stuff that we can do but I think we're on that road and I think we're making a good bit of progress on it.

Greg Dalton: We got time for a couple of questions. Yes, sir.

Male Participant 5: Hi. Thanks for coming to speak with us today. What other options did the Navy explore for reaching its 50 percent by 2020 goal?

Ray Mabus: In what way?

Male Participant 5: You mentioned that you were partnering with four companies to buy fuel at a pre-set rate. I was wondering if there were other options that the military explored to reach the same goal of getting 50 percent biofuel or 50 percent alternative fuels?

Ray Mabus: As I said, we're open to any idea of how to get there and we are technology agnostic as to how we get there as long as it's a renewable fuel. As I said, we don't have many requirements. We don't want to take any land out of food production. Any fuel's got to be a drop-in fuel, but outside of biofuel, I mean, we're dealing with solar, we're dealing with wind, hydrothermal, geothermal, wave. And, we're also looking at different ways of financing these sorts of things so that the private sector can put up a building or a power plant of some sort, solar, wind, something like that. We'll do an off take so that it's profitable for them.

The best example of how that's been done in the past is most of our military housing now is PPV Housing, Private/Public Venture Housing, where we guarantee a lease for a certain amount of time. Private sector bills the houses, they maintain the houses, they upgrade the houses. It's much cheaper for us, and the private sector makes a very fair profit. So, I think that there are ways that we can do this.

Greg Dalton: Yes, sir. Welcome to Climate One.

Male Participant 6: The club has really enjoyed your talk today, Secretary. A couple of questions coming from San Francisco. I'm a San Francisco Bay...

Greg Dalton: We're short on time so you can pick one.

Male Participant 6: Okay. Very good. Only one question. As a long distance cruising sailor we often attach wind generators to our boats. And is there any interest in the Navy in doing that? Thank you.

Ray Mabus: As I said, we are looking at various technologies to see, number one, what works, number two, making sure it doesn't interfere with our military mission because when you start hanging stuff off of ships that fire stuff, sometimes you got an issue there.

But if something works, it's like those beer ads: it's only weird if it doesn't work [laughter], if something works, we're going to give it a very hard look. And it's got to work at scale. It's got to work across the fleet. It's got to work across our bases.

The last thing I'll say is, we are seagoing service. We have almost 300 ships now in the Navy. We're growing back with 300 by the end of this decade. But we also have 3.3 million acres of land. We have 72,500 buildings. We're one of the largest land owners and building owners in the country so we can make a difference both ways, both at sea which gets most of the press and most of the attention, but also the stuff on energy efficiency and changing the way we power our bases. We'll have a massive effect as well. And in fact, the President, in the State of the Union two years ago, announced the Navy was going to buy a gigawatt of renewable energy for our bases by 2020, and that's part of the initiative for 2020.

Greg Dalton: Solar powered bowling alleys on the bases and everything else. We have time for -- yes.

Female Participant: Thanks. Secretary Mabus, thank you for being here. I wanted to underscore and thank you for your efforts to increase energy efficiency and also the microgrid. Those are two

areas that could be leveraged incredibly well across the private sector and very profitably. So more than biofuels, I would say investments in those, culturally, can benefit the world.

My question is in 2009 -- I Tweet these so I need to update people -- you set out five really bold process. Where do I get updates on those?

Ray Mabus: Well, number one, I Tweet.

Greg Dalton: You have a Facebook page, right?

Ray Mabus: I've got a Facebook page. But I can give you some dedicated links through my public affairs officers here. And I'll make sure that she gives you where those updates are posted. But you can get a lot of stuff we're doing through the Facebook page because there is a focus on energy there. We're also on a thing called Greenbiz.gov that all of the things we're doing in energy that businesses or private businesses that are out for contract goes through one portal, Greenbiz. And that's a place to look as to where we're going and what we're looking for.

Greg Dalton: Real fast. Last question. Yes, welcome.

Trevor Wynn: Sir, my name is Trevor Wynn a reserve endsman in the supply core. What advice would you give to our sailors on what we can personally do to keep the Navy clean and sustainable?

Greg Dalton: Perfect closing question.

Ray Mabus: Perfect closing question. Well, I've talked a lot about what sailors have been doing. And I've also talked about the type of people who join the US Navy and US Marine Corps and the spirit of adventure and the spirit of innovation and willingness to change. We've been doing that for 238 years. Keep doing it. Keep being willing to change. The conventional wisdom is almost always behind curve. And keep questioning it. But also if you see something that can be done, we're going to listen to you. Your CO is going to listen to you. I'm going to listen to you. The whole organization, that is the Navy, the 900,000 sailors, marines and civilians that are in the Department of the Navy. That's where this future is coming from.

I mean, I can come up with these goals, I can talk about various technologies. If we don't have the sailors doing it and the marines, it's not going to happen, but we do. And you're in this black core and there's a world of things that you guys can do. So I think that the biggest weapon we have are sailors and bullets.

We push responsibility down to innocents. We push it down to third class petty officers more than any military in the world. And we expect and we get great results day after day after day.

Greg Dalton: We've been talking about powering America's Navy and economy with Navy Secretary Ray Mabus. I'm Greg Dalton. Thank you all for coming to Climate One today. Podcast of this and other Climate One programs are available in the iTunes store. Thank you for coming to The Commonwealth Club.

[Applause]

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