

Energy Security and Innovation

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Deputy Secretary of Defense, Ashton B. Carter

Thank you for inviting me to join you here today. You know, if you're in the Department of Defense, you live in this world of Nunn this, Nunn that, Nunn-Lugar, Nunn-McCurdy – everything of any significance begins with the name Sam Nunn. So it's certainly an honor to be here with you. And I enjoy working with one of your successors, Senator Chambliss, very much.

Sam cares about defense and energy quite a bit. Sam's been interested in energy for a long time, and I thought about and rejected telling a joke he once told me about someone running against him here in Georgia who had an energy motivated line of attack on Sam.

The more I thought about it, the more I thought that it was not a lunchtime joke. But I will remind you later about that one. John Deutch would enjoy it. John, an honor to be with you, sir, and also Jim Jones and many other distinguished guests. I'd like to commend all of you at Georgia Tech for what you do in the research institute on national defense. Thank you for what you do. It's much appreciated.

I caught a little bit of this morning's panel and I know that Dan Yergin spoke to you and that you discussed what is true, which is that energy security is a part of national security and it, like national security, can't be pursued entirely within our own borders. And globally it can't be pursued entirely by the United States alone.

We have great burdens and great responsibilities for energy security around the world. But we also have great assets as well. Certainly one of them is our military capability and especially our dominance of the commons. And at the risk of being a little DoD-centric, what I'd like to focus on today is where energy fits into our changing strategic and managerial approach to defense.

I say changing for this reason: This is really a time of enormous consequence for us, all of us who care about national defense, because, as I say, two great currents are flowing together. The first is a current of strategic history. For a decade, we in the Department of Defense and we in the country as a whole have been riveted of necessity on two wars in Iraq and Afghanistan.

One of those wars has wound down and, for the other one you can see the beginning of the end. And so even as we press forward the fight in Afghanistan, we have to look up, get our head out of the foxhole we've been in over the last 10 years, and cast our eyes beyond, towards what the nation and the world are going to need next.

At this moment, we have this opportunity, and really the obligation to pivot to the future in a way that we have not been able to for some years now, so focused have we been on the

fighters in Iraq and Afghanistan. I'll remind you the one in Afghanistan goes on, so this is a true pivot where one foot stays in place and the other foot moves. But pivot it is.

And while we've been fighting those two wars of that particular kind, the world hasn't stood still, technology hasn't stood still, our friends and enemies have not stood still. And so now we need to move in step with these changes, and really in some places to catch up with them. We would need to make this strategic pivot even if we had all the money we wanted.

But we're not going to have all the money we want. It's very clear that the country expects us to play a part in putting our fiscal house in order. And so we're entering a period of not ever-increasing defense budgets, something we've been used to for the past 10 years. The reductions we've made in the defense budget to comply with the Budget Control Act are the most consequential adjustments we have made in the Department of Defense in 15 years.

Just to remind you of the facts: The base defense budget is not actually decreasing in coming years but neither is it continuing to rise in real terms as we had planned before the Budget Control Act was passed.

The difference between the expectation that we had and the reality that we now face over the next 10 years is the famous \$487 billion – \$259 billion over five years, which is about 9 percent overall, a very substantial adjustment by any measure.

To that large adjustment, you must add the reduction in overseas contingency operations, OCO funding or supplemental funding, covering, nominally, the marginal cost of the war but in fact much more than that. This is also coming down.

If you put the OCO reduction together with the slowing of the growth of the base budget, you have a downturn over the next few years in aggregate defense spending which is comparable to that after the Vietnam War and after the end of the Cold War, a very substantial adjustment.

The budget circumstance in which we find ourselves is the context for the remarks I want to give. We have just completed planning that adjustment, that proposal, the President's budget proposal on Capitol Hill. And let me tell you a little something about how we arrived at that because I think it was in my experience unprecedented.

The first is that we really did want to look at the strategy first and then build the budget around that new strategic vision. That's what the President wanted us to do. That's what Secretary Panetta wanted us to do and that's what we did.

And that's why you saw the strategy come out first in January and a little bit later the budget, because we used the strategy as our guide as we put together this big budget. It involved President Obama much more than any president in my experience, giving direction. And that was incredibly helpful.

A couple of other things that we were determined to do. One was to put everything on the table. It's important because we had to look at things that we hadn't had to look at in a decade or more, the things that are difficult and controversial and painful and that when you have money you can say, "The hell with it, I'm not going to get into that."

We don't have money now so we had to take the plunge. And so we did get into some very difficult issues.

The second thing we really tried to do – and the strategy helped in this – is not just to proceed by subtraction by cutting, but constantly try to build toward the defense that the country needs. The image I always had in my mind was of an ice sculptor: Some people focus on the chips that are flying away. We had to constantly press ourselves to focus on the sculpture that's emerging from the ice, which is the Joint Force we want in 2020. And the result is a strategic package and a balanced package, a well-rounded package. It's got three parts, of which one is particularly pertinent to this gathering.

The first one is our continuing determination to improve our discipline in how taxpayer dollars are spent. And so we have set ourselves some pretty serious managerial goals for savings, a total of about over \$210 billion worth, very substantial. These aren't things that you get just by waving your hand. These are goals you set yourself and you go out and earn. So we have booked them managerially.

This is important in its own right, but it's also important so that the taxpayer retains confidence that for the amount of money they are spending on defense they're getting their money's worth.

Second, we made some measured but essential steps to slow the growth in personnel costs. These are controversial. They are not winning popularity contests. But they're necessary. We have to control personnel costs because the alternative is reductions in force structure and modernization and other parts of the defense budget.

But most importantly, we made changes in our force posture and in our investments in accordance with the new strategy. Those are the parts that I think are particularly pertinent to this audience. I'll just tick off a few of them.

By the way, this isn't rocket science. These are the things you would have written down too if you just asked yourself, "Well, after Iraq and Afghanistan what should we focus on then?" I don't think any of these are terribly surprising.

But one was to direct some of that innovative thinking and resources that we have devoted to the fight in Iraq and Afghanistan to the Asia Pacific area, which is where much of the future lies strategically and economically. And therefore, the President's direction to us was to protect from cuts and to increase where possible investments that were particularly pertinent to that region.

So for example, Navy: We're not able to increase but we're not going to decrease the overall size of the Navy as measured by ships. But we are shifting the Navy to the Pacific so that we will have a 60/40 mix, Pacific/Atlantic, in the future, doing more forward stationing like the Littoral Combat Ship in Singapore, which makes it much more efficient; pursuing the MAGTAF in Australia; continuing with the Guam effort; and pursuing some other strategic opportunities with new partners in the region. And then making sure key investments are protected, the investment in the new Stealth bomber in its entirety despite this budget turndown, things like the Virginia payload module in the Virginia Class submarine, electronic warfare investments. I won't go through this whole list of things.

A lot of our investments were deliberately protected or enhanced to allow us to continue to be the pivotal power in the Pacific that we've been for 60 years, to the advantage of everyone in that region, including China, which is good.

A second thing the President said was don't unnecessarily keep around the force structure associated with Iraq and Afghanistan, the force structure we have built up over the last 10 years. We need to have the discipline to shift that force structure. That means principally reductions in active end-strength for the Army and Marine Corps.

This is not abandoning COIN. It's not any such thing. We will continue to retain the knowhow to do stability operations on that scale.

I wouldn't say that the country is very eager to do those kinds of operations anytime soon, but you never know. If we did find ourselves in a large and prolonged stability operation, we would have the time to rebuild the force. But, a) we're not going to retain that force and; b) we can't afford it, and so you will see those reductions.

The thing the President was most insistent upon and which is probably most pertinent to this audience is, he said, "Let's make sure that we don't lose our future oriented investments." The tendency when the budget goes down is for the last in to be the first out, for the most shallow-rooted to be torn up first.

They're our best ideas. They're our newest ideas. They're our most modern forces. They're our newest capabilities. He was, as I think any of you would be, very determined that we not do that. So in the categories of Special Forces, cyber, space, unmanned vehicles, and a number of our key industrial base areas, including science and technology and investments in energy, the theme was "don't eat the seed corn".

We've tried to apply that in the budget. Let me say exactly how we've applied it in the field of energy.

We divide our involvement and responsibilities in energy crudely into two areas. There are our operations – how we spent money on military operations – and there are the installations. Take operational energy: The biggest part of the operational energy bill is, of course, fuel. Fuel prices are somewhere between \$15 billion and \$20 billion a year over the next few years.

About half of that is for the Air Force, mostly for the C-17s and C-5 transports and the KC-135 and KC-10 tankers, the bulk of that fuel. About half is for the Air Force, and about a quarter is for the Navy – steaming ships mostly – and another quarter for the Army and the Marine Corps. Forward installations are counted in this way, and vehicles – about a half, and a quarter.

Obviously we are victims, as everyone who owns an automobile or heats their home or does anything else is a victim, of the vagaries of the market. The market causes us a lot of trouble at the scale at which we're buying fuel. But we are trying to preserve our investments in what I think Dan Yergin calls the fifth source, which is savings and efficiency. We have a very important effort in jet engines.

ADVENT is a piece of that, not the only piece of it, as are other engines, including helicopter engines and their fuel efficiency. We have significant efforts in vehicle and ship propulsion efficiencies, which we're going to preserve because we think they'll eventually pay off.

Outside of the fuel area, I'll just name two things. I was just in Afghanistan a couple of weeks ago and it's cold there now, and of course most of our expeditionary buildings are either not well insulated or not insulated at all. They were not put up that way. So in the summer it's blazing hot. They're air conditioned in the summer, and in the winter they're being heated.

When we first got there, I remember going in summer 2002, the Marines Second MEF had first arrived in Leatherneck. And going into Leatherneck, the Marines had been given a manpower target, and God bless them, their way of meeting their manpower target was to leave logisticians at home. So they were living in circus tents, with about 10 air conditioners all around the outside of these circus tents – the only way you could keep a tent cool in the desert.

We found ourselves over the years expending an enormous amount of fuel on forward operating bases and COPs, simply running the HVACs and generating power at those FOBs and COPs. When you do that, you have to transport the fuel. In some places, like Bagram, we just buy it at the gate and we say, "I don't care how you got here but bring your fuel here and we'll pay for it."

At other more austere FOBs and COPs, we have to actually transport the fuel out there, and that creates some risk and a level of effort that we'd like to avoid. So it's been important to us to improve the energy efficiency of FOBs and COPs. We have a lot of ideas for doing that, and we've made a lot of progress in doing so.

Another area that is important operationally, outside of fuel, is what's sometimes called the solar soldier. The troops talk about a death of a thousand ounces. They've got so many electronics on now. Everyone has a battery, and you can't do without it, so you have three spare batteries. Pretty soon, you find you're carrying 50 pounds of batteries.

As a consequence, we have a tremendous appetite for rechargeables, and also obviously for higher energy density batteries and smaller sizes. I'll say more about that later. That's the operational side.

In our installations, the Department of Defense is the largest real property owner in the world. We are larger by a factor of six in terms of square footage than the rest of the federal government combined. We are almost two orders of magnitude bigger than Walmart, the other largest private sector real estate owner. So we're by far and away the most invested in improving the efficiency of our installations.

In installations, we spend about \$4 billion a year here. We are trying to become more efficient. One way we're doing so is the good old DoD way, which is we just order that it be so and leave it to the base commander. We have one of them here today.

In theory, at least, behind the bases and installations is supposed to be an energy manager, somebody who knows enough about this field to understand how to take measurements, put meters in buildings, and make sensible decisions to procure the services of energy efficiency companies and improve buildings' energy efficiency. They start at the most inefficient technology on a given post, camp, or station, and move their way up the food chain.

We're trying to do that. We are also looking at more advanced concepts, like microgrids and renewables, as an augmentation. These are things we do on both the operational side and on the installation side.

Let me close by describing our role as a Department. Our citizens expect us to play a role in innovation and in advancing the frontier in the field. This is an important thing for us, and it's an important thing to say at Georgia Tech, which is one of our premier technical institutions in the country. Let me close on this.

We have to innovate to protect our country. Our technology is second only to our wonderful people in uniform, the best in the world, in making our military the best in the world. It's long been thus, and it needs to remain so.

Sometimes, the innovation we do is single-purpose, like some of the technologies that go into a Stealth bomber; these technologies are good for Stealth bombers, not much good for anything else.

Often what we do spins off, as the phrase goes, into wider use than purely defense. Consider GPS or the Internet. Or, in an earlier era, jet engines, communications satellites and so forth.

And this is an important function of defense expenditure.

Since we make up about half of discretionary spending in the federal government, it's a national duty for us to be custodians – good custodians – of the funds we administer for defense innovation for a larger national duty.

We feel that extra duty. At the same time, I hasten to say that any expenditure we make has to be in the national defense interests and contribute directly to national defense.

But that said, we do play a larger national role. That was never far from our minds, or the President's mind, for that matter, or the Secretary's and Chairmen's, in all of the deliberations that led to this latest budget adjustment.

Let me paint a little picture for you of how that plays out in terms of innovation energy in the larger frame of national duty. We do about \$70 billion worth of R&D every year in DoD, around about \$70 billion. Of that, about \$12 billion is science and technology related. The rest is associated with the development of particular weapons systems or their sustainment, which is a substantial investment in fundamental technology.

In addition, we provide funding to industry when they spend money on R&D, on their own behalf and on their own agenda – something called IR&D, independent R&D – to the tune of about \$4 billion a year. That's research where they choose the agenda and we provide the money for it. We don't choose the research agenda. Our theory is that, if we dictated the research agenda right across the board, you know, maybe we wouldn't think of everything that needed to be thought of.

Our defense industry partners also spend a considerable amount of their own money on R&D, out of their own profits. We don't have a good handle on that number, but it's probably a couple billion dollars.

If you accumulate all of this, it's a substantial wave of effort in innovation. From it you can conceive three ways that we in defense, in pursuit of our own national security mission, can contribute to the wider mission of national and international energy innovation.

First, we do R&D. We don't try to be the bestest or the firstest with the mostest in the energy field. That's really the Department of Energy's job. But we do have energy needs, as I've explained, that we are willing to invest in for the future because our needs are, in some places, different and less cost sensitive than they are in the general economy.

As an example, we're very cost sensitive when it comes to high energy density batteries because we don't like to burden the troop with the weight of all that power that he needs to carry around. So we're willing to pay much more for a battery of that kind than you would be if you were only going to use it in your flashlight.

Second, we have a huge volume of buildings and vehicles and a lot of real estate around the world. So in addition to doing research on our own nickel and for our own purposes,

research that may be pertinent to the economy as a whole, we are very eager to provide our facilities as a test bed.

We try to make them available for the Department of Energy. That's one of the secrets of our partnership; you do the research, we'll provide you the place. We'll provide you the fleet of vehicles, we'll provide you whatever, and you try it out.

We're very willing to do that. We even have an installation energy test bed program which is designed, in part, to fund projects that use DoD as a test bed, particularly the installations area.

Third, and this is probably most important of all, in some cases, we're prepared to be an early adopter of technology in ways that others cannot be, not because we're wasteful of taxpayer money and insensitive to technical risk, but for two reasons that make a lot of sense for defense.

First, there's some areas where we are cost insensitive in a way that the rest of the economy won't and can't be. We're prepared to invest and adopt before the rest of the economy and, sometimes, after we do – sometimes but not always – sometimes, that leads to a more economical version of the same product down the line as technology improves, a product that can be adopted and accommodated by the rest of the economy.

In the meantime, we both benefit on our own terms.

Secondly, unlike so many in the economy, we in the Department of Defense take the long view. We're going to be around a long time. Our cost of capital compares extremely favorably to anyone else's in the economy.

We're prepared to make investments that are sure to pay off, but won't pay off for a while, whereas others can't afford to place those kinds of bets as easily. We're prepared to do so. It's in the national interest. It's in the war fighters' interest. It's in the taxpayers' interest. We can justify it as a larger value and a larger meaning over time to society as a whole.

So these are the three ways in which it is meaningful and logical for us in the Department of Defense as part of the defense mission to be part of the innovative effort of the country as it faces its energy challenges. We'll be beneficiaries, but we do believe that what we do in the name of defense will be to the nation's benefit and the world's benefit for energy security, in the way that what we do in national security is in the nation's interest and, I would certainly argue, in the world's interest as well.

So on that note, I thank you, once again, for having me here, Senator, Steve, Rafael, and look forward to a discussion.