

**"Energy and the Air Force"**  
**Colonel (Ret) Ron Torgerson - Moderator**  
**Robert Guerrero**  
**Lieutenant Colonel (Ret) Lucian Niemeyer**  
**Mark Duszynski**  
**Col (Ret) Rich Fryer**  
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**Moderator:** On the panel today is Mr. Bert Guerrero on my left. He's an SES and is a Deputy Assistant Secretary of the Air Force for Energy.

Next to him is Lieutenant Colonel Retired Lucian Niemeyer. Lucian is the owner of the Niemeyer Group, and he was a recent advisor and functional expert to Senator McCain. I think you left this year, right Lucian? Right.

Next to him is Mr. Mark Duszynski. He's a Vice President of Business Development for the federal business of Johnson Controls. Mark's going to talk to you about smart buildings and building automation systems and other things.

Then lastly is Colonel Rich Fryer. Rich is a retired Air Force colonel. He's the Energy Program Manager at ECC, and he leads the ECC team for planning, developing and building our renewable energy and energy efficient business.

With that, we won't make introductions between the speakers. We're planning to have about 15 minutes of Q&A at the end, so save your questions if you would, and we'll do it that way. So each speaker will have about seven minutes.

Mr. Guerrero?

**Mr. Guerrero:** Thanks Ron, for your kind introduction. I'm looking forward to hearing the discussion from the different panel members. A distinguished group of folks who have been doing this thing for quite some time.

As Mr. Torgerson said, I'm Bert Guerrero, I'm the new Deputy Assistant Secretary for Energy. My background is, I was an active duty guy. I spent 12 years in the Navy flying helicopters and was a flight instructor for a little while

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towards my end. Did an inter-service transfer to the Air Force and during that time went straight to flying AWACS. Following that was at the Air Force Safety Center. So some of the discussion topics that I key in on in changing culture and the way we did it in the safety world I think have some applicability to what we're doing here in energy.

Just as an overview, as everyone knows, this is our mission. Our mission requires fuel, whether it's launching rockets or fighters or providing support to our mission partners and what I didn't realize when I joined the energy team or at least when I was looking at joining the energy team was how big of a piece of that is the aviation piece. So when you break it down, it's a pretty big chunk of our overall energy footprint. And as the DoD's largest user of energy there are some definite areas that I think we can look at that will help us along.

The office was stood up around 2006. At that time we set some consumption goals. By about 2010 my predecessor, Dr. Kevin Geiss who's out there, and he's going to, by the way, answer all the hard questions that you might have with respect to energy. He knows it all and he's been part of the group for quite some time, and I often call him to ask him things that he's very good at explaining to me.

Kevin's group by 2010 had developed a strategy, Air Force strategy, with respect to how we use energy and it was modified around that time as well to less look at consumption and more look at directly, at efficiency.

In 2013 they published an updated strat plan. The strat plan has these four pieces to it. So improve resiliency, reducing demand, assuring supply and fostering an energy aware culture. I want to go into a little bit into what we're talking about with each one of those pieces and how that applies to the field that we have.

As I spoke earlier, this for us is a big part, aviation fuel is a big part. Facilities, about 11 percent; vehicles about 3 percent. A big part of the overall Air Force budget. So when we look at that and we look at \$8 to \$9 billion, and any small impact that we make on the energy side, the one to two percent

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piece that we cut out of that pie can be substantial gains towards going right back into the mission. And that's what our office is focused on.

Part of that is partnering both internally within the DoD, so we spend time learning -- For example, the Army has a much more robust installation footprint, energy footprint than we do, and we learn a lot from them on how they're executing that footprint. On the Navy side they spend a lot of time looking at green fuel technologies and how that can help support their fleet. For our piece we have the predominance of the aviation assets and we think that part is big.

When you look at our overall strategy, when we talk about improving resiliency, what we're really talking about is being able to look at the bases that we have and how we preserve the energy that we have there, depending on whether it's a manmade or act of nature type event that could affect our ability to provide energy to the mission.

Reducing demand has a couple of pieces to it, so when you look at aircraft and our ability to upgrade our aircraft to make them more mission capability, that really goes to that particular piece.

The assuring supply. Kevin's folks did a lot of work in the past few years of driving home the ability for us to look at the types of fuel that our aviators have throughout the world, and ensuring that that supply is compatible with our aircraft. So we've done a lot of work in making sure that two different types of commonly available alternate fuels are available for us should we need them.

Now, are they competitive right now with the rest of the market? No, they're not. But we're positioned so if they are, then we can take advantage of that.

The final thing, with the energy aware culture for us, we really see that you know, when I worked in safety over the past 20 years we've seen a pretty dramatic change in the way the safety culture worked. What I mean by that was when I was a young aviator we really didn't have these risk assessment matrix, we

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didn't really think through the safety part of our mission. Since then, it's part of the planning.

So when the young pilot goes out to fly with his copilot and his crew, he's looking at things like how complex is that mission? What kind of weather do we have? What kind of, how experienced is my copilot? Is it day or night? Those kinds of things are a consideration that's firmly cemented now in the aviation world and with a lot of it from the leadership of the folks at Air Mobility Command who really have taken a hard look at this. And they've done the same thing with energy as well. So that's a bigger consideration when you look at some of the things we've seen in the Air Mobility Command that have the ability to translate to any of the other aircraft that we fly. They're flying about nine percent less, with nine percent less fuel, the same amount of cargo. That's huge. That's a big piece of the overall budget and that piece is by looking at smart procedures, whether it's -- One of the examples was at Altus Air Force Base, there is a pretty good example of folks who looked at AR Tracks and they looked at airdrop procedure training and were able to save over \$30 million in one year just by optimizing those tracks and optimizing that training. Not affecting the way we train, not affecting the mission, but still providing it with much less fuel requirements. To us, as you translate that to the field, that really means that we're able to produce more mission deployed with the same amount of fuel that we would in the past and that's what our bottom line is.

Anyway, getting to partnerships. We look at the way our various different partners, whether they're public/private, ESPCs or public/public. Much in the same way that we partner with let's say DOE on looking at fuel compatibility, looking at our partner services and how they're doing with that. We feel it's important to make sure that we're grasping all those different parts, and that's why I look forward to hearing what else the panel has to say because I think they can help us address those things in areas that we need to go to.

Sometimes we see that small bits of technology, and that was one of the discussion items that's going to come up, small bits of technology like, for example, upgrading engines on a certain plane, can have second and third order effects that we didn't

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really plan for. The small group that we have, it's called the Energy Analysis Task Force, it's part of the Reserves, looked at that. They looked at the KC-135 and the addition of engines to upgraded engines, more powerful, and found that fuel dump requirements were much higher gross weight than they'd seen in the past, and that was because the engines were more capable to provide go-around procedures for that aircraft with less requirements. So that particular initiative, which resulted in guys landing at heavier gross weights because they could fly on two engines as opposed to three, resulted in about a \$3 to \$4 million impact to just that one particular piece in theater. Folks were dumping fuel, they're not dumping it anymore, and it's all the same equipment that existed over the past several years. It was just digging down into that one particular piece that hadn't been considered when you upgraded the engines, because the engines themselves added all these other things that were goodness for us to include power and conservation of fuel as well.

Other things that we've seen that this Energy Analysis Task Force has done that I think can be encapsulated not just in the aviation world but in the civil engineering world and in the vehicles, is looking at things like fuel efficient descents. We had C-5s that come into Travis Air Force Base that have looked at optimum ways to hit a certain point and reduce the throttles to idle or close to idle and glide in and configure on final as opposed to getting sent down to a medium altitude which is much less efficient.

Some other things you see in there kind of go into what we were talking about, about the ability for Air Mobility Command to reduce their overall cost and fuel by precision loading the KC-135 landing weight, and another one is just sometimes ground power works just as well as the APU in the aircraft, and just changing the culture to say you need to do these kind of things, and making it public and making everyone aware that these different options are available can result in big savings that cut into that \$8 billion of fuel that we spend every year.

This is our effort this year towards enhancing that culture. That's the Energy Action Month in October. So what we're going to be using over that month is various different competitions

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that you have on the bases to look at energy, but we want this to be more than just a civil engineering thing because it really is bigger than that. For us it's every piece of that \$9 billion fuel pie has the ability to be analyzed closely and reduced without affecting the mission.

In this case, this past year I think we had eight award winners and we're going to use vignettes of those particular folks talking to what they did, playing it on AFN, playing it deployed so that we can spark more interest in the idea of, the example I used with Altus, the idea that there are ways to go and attack a problem and make a big impact just by spending some time with it that may not be driven top down, it could be driven top up, but if it doesn't affect the mission, it increases the fuel efficiency it's definitely something we want to look at.

These are some more of the successes that I discussed. In some cases, like one case when you talk about smart grids, we actually had an Airman who acted like a mini-smart grid. In Misawa Air Base Japan we had a situation where because of Tomadachi and the issues they had with the reactor out there, that the base was forced to look at how they spend energy. This one individual, one captain, saved by looking at what they could afford and what they couldn't afford energy wise, he was able to take a pretty big cut in the energy expenses not just for that time there but throughout the year. Now if we're able to take that kind of initiative and apply it to all our other bases, imagine what kind of savings you can have.

That pretty much concludes my initial introduction on what we're talking about. Again, I look forward to listening to what everyone else has to say. I'm new to the game so there's a lot I have to learn, but my staff and the foundation that Dr. Geiss set for us, we're really positioned to take advantage of the new technologies and the changing culture that will result in more mission with the same amount of fuel. Thank you.

**Lt Col (Ret) Niemeyer:** Ron, I really appreciate the opportunity to talk about it, and what I'm going to about a little bit more is a different perspective. It's where Congress has been the last year and where we're going as far as support for some of the DoD energy initiatives.

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My role on the Senate Armed Services Committee for 11 years, I had the energy portfolio for five of those years, pretty much driving policy and driving in some cases mandates, but also changes to public laws. I'll go ahead and give you an update on where we're at right now.

Before, as we're working on the slides, one thing I do want to point out, the DoD guidance which came out this year on both operational and facility energy has kind of taken a different tact and it's going to be a little bit more consistent with where we're going with Congress. The goal here, for at least from the Senate Armed Services Committee's perspective, is look at initiatives that maximize savings and provide money for other core mission requirements. That's really, from our perspective, been the primary goal, should be the primary goal of any energy program.

From what I've seen in the five years when I was on the committee, the Air Force from my perspective had the best approach, had the most, from where we stood, the more guided focused approach on exactly where we felt as a committee that the services need to be moving towards. And I would say as a culture change, hopefully that part of the culture does not change. You concentrate on efficiencies, you concentrate on savings, you concentrate on payback as opposed to satisfying some type of arbitrary mandate. I would just suggest that the Air Force approach is really something I think the rest of DoD needs to go towards as opposed to the Air Force trying to adopt a DoD approach.

I'll go ahead and get started even without the slides.

The one thing that you'll see both in the Senate and the House bill is a concern about spending excess funds on biofuels. So you have limitations in both bills about this, the expenditure of O&M funds for the purchase of biofuels in an operational environment. This really goes back to an issue we had with the Navy a few years ago, if you all were watching in the press about the gray/green fleet and the efforts by the Secretary of the Navy that proved that he could run a military exercise on biofuels.

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From our perspective it wasn't really anything he needed to prove. We all knew that those engines had been certified. What we saw this more was a bit of political theater at the expense of about \$20 million in O&M funds.

So what we've tried to do, both in the House and the Senate is restrict those types of exercises or endeavors in the future that don't necessarily prove anything other than to make a headline.

Both the House and Senate bill contain restrictions on the use of O&M funds for the purchase of biofuels and that's really what we're going at. We don't want in any way to inhibit continued S&T or continued research and development and making sure we can certify the use of alternate fuels. We're just concerned about using O&M funds for operational purposes when you can actually spend a lot less money to satisfy the requirement with conventional fuels.

One of the things too, and I'll make my comments real quick, particularly since I don't have any slides, but also I want to get to the questions.

We do continue to emphasize on our committee, and in the House, that any future acquisition programs, any type of research and technology to new engines, does look at energy efficiency as a key performance parameter. We had some report requirements a few years ago that have not been satisfied, so you'll see an update in legislation in the Senate bill asking for an updated report on where we stand on trying to make sure that energy efficiency is incorporated in all key performance parameters for all systems in the Air Force and all throughout DoD.

One last thing that I do want to point out which is interesting on the installation side, is the Senate included some report language that clarified the use of power purchase agreements. There's been some ambiguity as far as the use of Section 2922A of Title 10 as well as the use of power purchase agreement authority. And to what extent those authorities are flexible for projects off the base using transmission lines that aren't necessarily owned by the Air Force. There's some pretty



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extensive report language that I think will be beneficial to the Air Force, and we're working with OSD lawyers and trying to push some of those deals forward.

The goal here, again, is to allow for ESPCs and power purchase agreements for those projects that will ultimately save the Air Force money over time. The goal here is not necessarily, again, to satisfy a renewable goal, but to make sure that over time, whether it be 20 years or 50 years, the Air Force can see a savings and that can be applied to other accounts.

And without my slides, I'll conclude my comments.

**Mr. Duszynski:** Good afternoon. I'm Mark Duszynski with Johnson Controls.

Thanks to Colonel Torgerson and the panel for allowing me to speak.

You heard a little bit about policy, you've heard a little bit about budget and Congress. I'm going to talk about technology and I'm going to talk primarily about as it relates to installations, sort of the step child of energy, but still a huge area in the Air Force for cost reductions.

I was told that the Air Force is the tech savvy service. I just heard that in General Welsh's presentation, so hopefully you'll eat this up.

Many of you may not be aware of this, but just in the last handful of years there have been numerous technologies and new applications of existing technologies that have emerged in the building efficiency industry. You've got a list of them here, and I'm going to quickly go through these and kind of whet your appetite on them. But I believe each of them includes multiple benefits to the DoD and the Air Force in its quest to reducing installations' energy costs.

So these are some of the more impactful developments. I'm going to give you some background on them and quickly go through it. If you have more questions, come up and see me after the presentation.

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The first area I'd like to talk about is that new software has been developed that allows for what I'll call the modernization of energy management control systems and this entails integrating multiple controls, automation, metering systems into a common architecture. It doesn't sound real glitzy but it really does bring many benefits including reductions in utility spending, it improves energy security and the typical paybacks for these sorts of investments are in the two to three year range. So by any measure this is a great investment and it's basically software, just making all these disparate control systems work better together. So we'll call that modernizing energy management control systems.

This is also an important part of demand side management in a smart grid, micro-grid application.

This graphic just shows kind of at a high level the architecture that is included in these modernizations. At the core of this is the little photo there of a base operations control center. This really complements the technology. You put trained operators in these centers and they can more than pay for the cost of having them there because they allow the installation to better use the systems and the technology.

The next technology I want to talk to changes dramatically the building envelope as it relates to energy costs. It's called chromogenic dynamic glass. A couple of the key benefits are that it lowers energy consumption in the building. In other words, less money is spent on lighting, heating and cooling. It also lowers the equipment costs because you need lower heating, ventilating and air conditioning systems.

How does this work? The way it works is that a minute electrical charge across the glass of exterior windows changes the amount of light transmission that occurs through those windows. In a switched on mode, you have direct sunlight is blocked. That reduces summer cooling costs. In the winter, you allow more light in and that reduces heating costs. Throughout the year you have dynamic control which allows you to vary the transmissibility of these windows depending on the situations. If you're giving a presentation, rather than pulling the blinds

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down you just hit a control and you darken the windows. Pretty incredible technology. I've seen it personally.

The breakthroughs in the last few years relate to the ability to manufacture this in high volumes.

It also brings benefits related to occupant comfort and window treatment maintenance costs. You can virtually eliminate your window shading. You do not need shading. That of course improves the views out of the windows. Architects love that. You can optimize your day lighting. And it's a more controllable environment. You eliminate glare and those sorts of problems that affect occupants.

There is actually a DoD demonstration project for this technology at Marine Corps Air Station Miramar. The project was completed last summer. There's a report that's available on this by one of the national labs and the results have just been tremendous. Twice the energy savings of low-E windows. It reduces the peak load for demand charges, greater life cycle costs, and of course the improved occupant comfort.

Continuing on I want to talk a little bit about a really complicated challenge I think not just for the DoD but all of government and even private industry and that is the fact that data centers consume so much energy. Eleven percent of all federal electrical consumption simply goes to operated [data] centers. Thirty-seven percent of all federal data center are on DoD installations. Almost half of this energy goes just for cooling the waste energy that the computers give off. So this is a big problem. Fortunately recent technology developments will help all of us address this.

The breakthrough I want to talk about, which is really I believe a disruptive technology, it's called direct server liquid cooling. What this does is it eliminates the need for air conditioning fans in a data center, and HVAC cooling directed to those fans.

The way it works is that within a server, and that's the most prevalent piece of technology in a data center server. You have some storage units but it's primarily servers. Most of the heat

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is concentrated in point locations in the servers. The traditional method is you blow cold air through the room which eventually gets to the servers and cools them.

With this technology you take the cooling in the form of a liquid directly to the heat source and you bypass the air conditioning units in the room entirely.

A more even advanced approach to this is called total immersion liquid cooling. Here 100 percent of the device electronics are submerged in a core coolant which is a non-hazardous, non-volatile, low density dielectric fluid. It has 1400 times the heat capacity of air, so it's that much more effective.

The coolant is circulated directly through the electronics and we've seen energy reductions of up to 90 percent using this total immersion direct cooling.

The other benefit of this new technology is that you get better space utilization. Your typical server rack in the data center today is populated with only about 16 servers while the capacity is about 40 servers. So you get automatically the ability, because of how you're cooling to increase the server density, because the main hold-back on the 16-server rack density was the inability to cool it sufficiently. So if we go and we direct cool it, now we can load up these racks and we can free up a lot of space. This is a big deal as it relates to the data center consolidation initiative throughout the federal government.

This technology is also being demonstrated on ESTCP project. This one isn't quite as far along. It's at Redstone Army Arsenal. This project will be done sometime early next year and the results will be published. But early indications are that this is a very beneficial technology.

Another new area is stationary energy storage in the form of lithium ion batteries. What's new about this in just the last few years, is the scale. You can now buy these units up to one megawatt in size.

An interesting story, these were developed in Japan, this advanced technology, in response to the tsunami where suddenly

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energy storage became an important asset. So Hitachi primarily developed this technology. It is now available for sale in the United States. This is a great peak shaving solution for DoD installations. So large energy storage lithium ion batteries.

Moving on. Big data is having an impact on DoD installation technologies also in the form of enterprise facilities information systems. These are the systems that can cover an entire installation or even an entire region. They have unique reporting capabilities related to meter reports, but more importantly, they allow for really robust data visualization of what is going on relative to energy and other physical assets on those installations.

Also they have embedded analytical tools that are used to identify energy reduction opportunities, meter analysis tools. IT really supports the whole idea of let's use our ability to analyze data to pinpoint areas for improvement. These are some really phenomenal tools that again have just been developed in the last couple of years.

My final technology for you is rather basic yet it's extremely impactful and that is plug load management systems, particularly when they're integrated to a base-wide energy management system. You know you go into your office and administrative buildings and 25 percent of the energy in those buildings relates to the outlets, the plugs, the loads that go into those. Coffee makers, PCs, printer. Well, if you can better manage when those loads are turned off, you can actually save, and this is the results of a GSA study, you can reduce that percent by about 26 percent. So right away you can reduce one-eighth of your facility energy in offices and administrative buildings. It's a very basic technology which allows you to turn off loads when people aren't around, as an example, and it does it automatically at the circuit level.

So those are just kind of some teaser topics for you. I'm very excited. My career at this point is focused on energy improvements for the DoD and I encourage the Air Force to take a look at these technologies because they can do some amazing things and they more than pay for themselves in short order.

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Thanks.

**Col (Ret) Fryer:** Good afternoon. The last speaker of the day on this one.

It's my pleasure to be here for the fourth time now, giving you an industry update or perspective of how industry looks at how the Air Force is doing and DoD and the federal government is doing on their energy goals and how they're meeting them.

My industry -- I need to qualify my industry outlook or my industry perspective. It consists of myself and four other trusted advisors in other firms, none of whom have a DoD background. So your sample size is four here. But interestingly enough, the four people I talked to, all of us had the kind of same impression. Now it's positive about the Air Force, but it's not necessarily as optimistic as it has been in the past.

I have to start this with a cartoon, a nice little scene-setter here. There you've got your traditional power sources, and hopefully all three [down]. The embracing of renewable energy is not necessarily easy, whether it's PV or wind.

All of us out there, we're looking at what's going on, what you guys are faced with in the federal government. The goal post -- 2015 is right around the corner. That's when the current Energy Efficiency Initiatives are supposed to have been realized. The expectation I think I would have since these have been around since 1973 is that there will be another set of energy efficiency goal posts and the goal posts will move. The federal government will continue to become more energy efficient.

To do that there's a recognition certainly amongst us in industry that you guys don't have enough money to do that. The Air Force has made more of an investment I think than the other services. The Navy has followed suit, although I think they're running into the same problems as the Air Force. There just is very fiscally constrained times. The Army has done a lot of interesting stuff, none of which seemed to have invested their money.

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So all of the services are relying upon other people's money. Industry recognizes that. The financiers on Wall Street recognize that. And to a certain extent that money is there for good projects.

I talk a little bit about what those are. We talk about PPAs. Those are EULs, ESPCs, UASCs. Those are just the various tools you can get other people's money to execute projects.

On that last bullet down there, and this is especially true that we have found with maybe not so much the Air Force but with other agencies, that the agencies still need their O&M to be able to support those efforts. Because people have got to have time to charge to, it takes O&M to pay for the salaries or the contract supporters, the civilians who work it, and so that has actually turned out to be a constraint for some. I don't know if that's going to be one for the Air Force but it has been a constraint for other services, other agencies.

So we in industry continue to see as the goal posts change evolutionary progress by the federal government and the Air Force and others, both for RE and EE.

We had a previous speaker mentioned, with the exception potentially of perhaps revolutionary changes in micro-grids and smart grids.

The folks I talked to were less optimistic than we have been in the past, so I put it bluntly in the side, and there's a couple of reasons for that. I'm going to hit some of those.

So last year I was up here talking about this great Army thing that the Army did. They came out with this wonderful MATOC, a \$7 billion IDIQ contract that got industry all excited. We thought okay, finally Army's going to come up and do something really neat and catch up on meeting all of their goals and such.

Well, a year ago they awarded the contract, and they made over 80, I think that number's now up to 100, 100 contractors, awards have been made to contractors, but not a single task order has hit the street. So that's had a little bit of negative impact

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on how industry perceives federal agencies and the DoD, not necessarily the Air Force, and how you're proceeding.

The other thing is this. A lot of the incentives that previously made these projects doable, especially renewable energy projects, and particularly the [room energy] projects, they're sunseting. It's already over for wind and biomass, sorry, geothermal and biomass. And solar sunsets in December of 2016 unless Congress does something. Lucian, I don't know if there's much of a chance of that happening. Everybody else I've talked to says it's kind of a fat chance, but you never know.

**Lt Col (Ret) Niemeyer:** Fat chance.

**Col (Ret) Fryer:** Fat chance, okay.

So that's going to have some impact on your renewable energy goals, your renewable energy advances. It's not going to impact the energy efficiency stuff because that always has to pay for itself.

And then the other thing that's kind of got industry a little skeptical. Again, none of this affects the Air Force but the Air Force needs to be concerned, make sure they don't follow the same mistakes that other agencies have done. But here are some examples of some of the things that we've looked at that the other agencies have put on the street.

My first case study will be a service who shall remain nameless where they cited a PV array for industry to come and build right next to a firing range. So if that wasn't bad enough, because hey, you're building a glass house right next to a firing range, and recognize all rounds are supposed to go downwind, however, you have to get these projects financed. You've got to take them to Wall Street. People at Wall Street will look at risks, they look at risk management, and it's going to be very difficult to explain to them that the chances of this [inaudible] impacted.

But the other aspect about this is the site had no transmission. Zero transmission. And transmission is expensive. Fortunately transmission on an installation, a federal installation is easy.



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Transmission off a federal installation is exceptionally difficult.

So there's one. And there was a lot of interest about this until we all went down to the particular site, saw it, recognized the lack of transmission, the lack of other aspects of the site as well.

Here's another one. An agency who shall remain nameless had this great idea to build a bunch of wind turbines on their installation. The only trouble is, the sites they had available were right next to facilities. If any of you have been near a wind farm you'll recognize kind of some of the automatic things that one should have recognized that you don't do. Wind turbines are noisy. Siting them next to occupied facilities is a real bad idea.

But on top of that, this installation was northern tier which means in the winter time the blades will ice up and you cannot have any occupied facilities within I think it's three diameters of the blades of a wind turbine.

So essentially that project hit the street and industry got temporarily excited until we all looked at the sites and said --

The last example I've got which is kind of impacting industry is a recent one where an agency is all excited, wants developers to come on in and provide PV power, solar power to their installations, but not provide land. And these installations actually have a reasonable amount of land for solar but they don't want to make it available. I think it had something to do with the 2922A process but I'm not sure.

But that said, building transmission off of a federal installation in the public sector is exceptionally difficult. I am in the process of doing a 100 foot transmission line and it's taking me an entire year of permitting, public utilities, 100 foot transmission line, and entire year of public hearings before the Public Utilities Commission, and easements and all kinds of other stuff. It is a nightmare. So that is one of the nice things about building on federal installations. We've just got one client to deal with, and one set of rules to follow.

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I was going to go into another case study because this one is very close to home. This is a development that is still in progress that I am very close to and it's -- Let me just say that these developments that we do for the Air Force, for interagency are very complicated. So I mean they're not complicated from a technology point of view, it's everything else.

The agency had a great idea, had land, made it available, put it out as a small business award. That's no problem with that because most developers, if you understand most developers they're not always big corporations. A lot of developers are small businesses. They are literally mom and pops. But they understand development and development is complicated. So they put it out as a small business, awarded to small business. The agency had been sold by some salesmen on one particular type of technology, we won't mention what it was. But it was the most inefficient form of solar technology there was. And they fixed that but it all involves redoing the RFP, et cetera, et cetera.

Then the NEPA was, you've got to do your NEPA and it's best that the agency do the NEPA, not expect industry to do your NEPA, et cetera.

I'm not going to go into all of those other than this project which is roughly a 15 megawatt solar array has been in development for four years and a shovel hasn't gone in the ground yet.

What's my message?

First of all, applaud the Air Force. None of those projects were Air Force, pretty cool.

Learn from the mistakes of others.

Keep at it.

One of the things I couldn't emphasize enough is conduct due diligence. And that goes down into your next bullet.

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Those other agencies had outstanding experts helping them develop their projects. Really smart, high powered ANAS type firms doing that. One thing I would say to the agencies is to remember that those ANAS firms are not always, those advisory firms are not always motivated to kill a project early in its stage. So take that for what it's worth.

For industry, that last example I gave you, we've hung with that client for four years now. It's going to be a good project. It's going to take a while to get there. So industry needs to hang in, [patience for partnership] and then speak up and continue to provide innovative input as we learn more, as tax rules change, as policy changes, as RPSes come and go, as innovative financing opportunities come and go. We need to kind of keep you informed.

That's it. There's my closing cartoon.

**Moderator:** The floor is open for questions and I realize it's late in the day and some of you may have to catch the bus and if so, do that, but we're open to your questions.

**Audience:** [Inaudible]. Conservatives have been at the business of energy now [inaudible] for about five, six, seven years and [inaudible] the Secretary [inaudible]. The culture [inaudible]. Considering your background as an operator, particularly with the inter-service transfer, is there a reason you made the statement [inaudible]? Do you still see considerable opportunity in [inaudible] space? If so, [inaudible] within the Air Force [inaudible]?

**Mr. Guerrero:** I do because I see that we've had one MAJCOM that's really looked at this quite focused, and they've had a pretty good return on investment. There have been other pieces that have been looked at in the other MAJCOMs, in the other aircraft we operate, but not to the level that that one MAJCOM has looked at it. And we've seen them be able to provide much more mission for the same amount of gas than they did in the past, and being a former AWACS guy, I see things that we did, things that we continue to do. And when I reach out to the wings and talk to friends, not just in AWACS but in other airframes as well they say yes, I have some ideas. They're very

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excited about those ideas. But they need someone to come in and help them study it. That Energy Analysis Task Force has done that on several different occasions in other areas. Is it going to be on the order of 25-30 percent? Probably not. But just those small bits, 2 to 5 percent of our \$8 billion fuel budget or \$7.7 billion fuel budget could mean a lot and it would be well worth the manpower that we put against it to analyze it. And we've really seen that leveraging the reservists, some of them who in their day job work for the airlines and see what the airlines are doing and then they come back and go, there are sometimes when it's not a one-for-one swap, and we realize that. But there are other times where they go, there's no reason why we shouldn't be doing it this way, and by doing it in a different way that still allows the mission to happen, they're able to increase the productivity, increase the efficiency of the operation. So yeah, I do.

Now obviously there are other pieces. There's a technological piece and you've got to have the money to be able to do that as well, but this is one area I think is well worth the time and investment and that's why we're looking at it.

**Moderator:** Lucian, this one's for you. This comes from the floor.

There are a number of initiatives to address facility energy usage. Have the defense authorizing committees looked at how we can address industrial or process loads for places like our depots?

**Lt Col (Ret) Niemeyer:** I think what we tried to do a few years ago by requiring a minimum level of investment in our depots, 6 percent, and to some degree the services have fallen into it, others are not. Really, that is an area that's absolutely ripe for finding greater efficiencies in energy usage.

Our depot infrastructure really has fallen behind in many cases. I've pretty much been to every major industrial facility in the country and a lot of times it looks like a cold war, right after 1945 as far as what we're running. And we definitely, need to prioritize that.

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The key here, unfortunately it's like everything else, you compete for resources.

What we do have available through the committee is an authority to allow for a pay-back value, it's the establishment of a fund. Unfortunately the services have not fed it, but it is on the books, to allow a fund to be established and authorized by congress that would allow for projects to compete against that, specifically towards equipment upgrades that will offer a payback over time.

We put it on the books about five to six year ago, but it really is up to the military services to actually take some money and put it against it and then try to incentivize the three Air Force depots to compete against that to try to modernize equipment. Other than that, it's kind of tough for us to get away from what the Air Force provides as priorities and say okay, we're going to take money from this and go ahead and start modernizing depot equipment. That's not something we've historically done.

**Moderator:** Thanks Lucian.

The last question I have from the floor, unless you have more, is this. Addressed to the panel.

With all budgets dropping in the Air Force, where do you see the future of ESPCs with MilCon dollars dropping?

Probably Mark, Mr. Guerrero, Lucian.

**Mr. Guerrero:** In the Air Force we took a little bit of a pause on ESPCs back in the late 2007, 2008 time frame and then with the presidential challenge we got back into the business and are looking at it a lot more heavily than we have in the past. And while our execution rate up to today is not, I think it's like about \$80-some-odd million right now towards about a \$500 million goal, we're taking our time and we're making sure that those projects that we have, that we're looking at, are both cost-effective, because that's the bottom line, is does it really add to the mission or not? And so while despite the fact that we have maybe \$80 million now, we have in the plans over

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the next couple of years to execute to the tune of another I think it's about \$430 million worth of ESCPs.

So yes, we're looking at them. They're, like we said, there's not a lot of money out there internally within the Air Force, so we're looking for the private partnerships that make sense for us, depending on the base that we're at, because at some bases PV arrays will make sense; some other bases maybe they don't. So we're looking towards that. As long as it's a good investment for the Air Force and helps the taxpayer we're going to look at it closer.

**Mr. Duszynski:** If I could just add a thought or two from the industry's perspective, speaking from Johnson Controls and Sunesco, what we think is that ESCPS actually bring new technology in their implementation faster to the Air Force. All the things I talked about earlier, we are actually evaluating when we build out a scope on an ESCP project right now.

I would argue that that's the quickest way to get new technology deployed in terms of installations and energy efficiency.

And the industry has enormous capacity to serve all of DoD, all the federal government in these tight budget times when it comes to energy. So there's a lot of money available. The lenders are very eager, and the ESCO community is qualified and has the capacity to respond.

**Moderator:** Thanks Mark.

**Lt Col (Ret) Niemeyer:** You talked ESCPs, let me talk MilCon for a minute. There's no doubt there's pressures on Air Force budgets across the board as far as across the board that's going to drive down SRM and drive down MilCon and we've actually seen both SRM and MilCon be used to address energy efficiency initiatives.

What you will not see I think is a decrease in the near term of the ESCP account and I think that still offers a fantastic opportunity. There's been some concern on the part of the committee that OSD has diluted that program a little bit by deemphasizing payback value, by rolling in some water projects.

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By rolling in some projects that from my definition does not really meet the intent of what the program was originally established to accomplish. So I think we're trying to get back to using that \$150 million per year. I know we do like the way now that the department is competing in that so it's not just broken out into allocations but we're looking at maximum payback.

I think that's steps headed in the right direction and I would definitely encourage the Air Force -- we're going to have a period of low MilCon, but as long as you're pushing forward projects that are sound, that are valid, that offer an immediate payback or a near term payback, I think there's still an opportunity there with the ESCP account to take advantage of that.

**Moderator:** Thanks Lucian.

Rich, do you want to add anything?

Any other questions?

**Audience:** Greg [inaudible], Lockheed Martin. An industry comment.

I've been in several forums where we've talked energy to a number of DoD officials, and a number of companies have talked about the fact that when you do a business case analysis the individual base or command is looking at this from a business case analysis, that a lot of the energy projects don't score very well because there is some up-front cost. But if you can get through that up-front cost there are steep savings at the back end. But a lot of times that doesn't score very well when there are other things that show an immediate payback, although not very good future savings.

Have you thought about how to make the scoring better, or allow for some of the more expensive up-front and then significant savings in the back?

**Mr. Guerrero:** I'd just say from an Air Force perspective, and General Green's back there so he can clarify the answer if I'm

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wrong. But we, the first time in a while where we've taken a holistic look at our integrated priority list. So there's a formula that they look at that includes, energy factors into it because we know in the long term there will be a payoff. So that may not -- It helps those projects which we know in the five year cycle may not compete as well, it helps them compete better. And we saw this previous year that those projects did compete better and made it above the line. So from our perspective we're taking that into account because we know it's important and that's the way we're doing it is by having a formula that adds all the other pieces to it but it has an energy piece as well that weighs in on those decisions.

**Moderator:** Thanks, Bert.

**Lt Col (Ret) Niemeyer:** That historically has been a tough nut to crack. Not just in the facility accounts but also in the operational, procurement accounts. As far as spending up front to buy an engine that will save you gas over the long term. IT's still tough to justify.

The ESCP program was set up to allow for a series of projects based solely on payback and not compete against MilCon. So we tried to address that issue in a very small scale with the ESCP program. Should that be expanded? Absolutely. We talked earlier about depots. That's exactly why we put an account on the books so the depo projects wouldn't have to compete against other Air Force priorities, but could actually compete within themselves based on payback.

Ultimately we should probably look at that more from a congressional perspective on setting aside pots of money. The problem is it's got to come out of someone's TOA, that set-aside. That itself has to compete.

So it really is difficult. This is a problem which has plagued federal government for a long time, trying to plan life cycle requirements that will require an up-front cost, particularly if it ends up having a budget impact and the whole scoring issue overall with OMB has led to a lot of stifling of innovation, particularly in the use of the private sector where you've got to score that budget impact up front even though you're going to



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see savings down the road. It continues to be a conundrum for the committees.

**Moderator:** Thank, Lucian.

I think we have time for one more question. Any other questions?

**Lt Col (Ret) Niemeyer:** If not, I've got one. Energy security. I think at least on the committees there's been, and I should have brought this up in my comments and I apologize, it was on my slides.

There's been a discussion on the committee of what energy security is all about. The administration uses those terms, and I think there's confusion as far as what the committees would like to see.

I think what we're asking for more particularly in some of the projects that have an energy generation piece is what will that energy generation, whether it be solar, whatever the source is, how will that actually affect or allow for preservation of the military mission?

Some of the projects we're seeing right now, they have generation but that's going right into the commercial grid. It's not necessarily involving switch gear storage that's going to allow critical missions to be sustained in the time of a commercial power outage. I think you're going to see a much greater emphasis in the future as far as congressional oversight that requires projects that have a generation piece to make sure that we can preserve critical military functions, and there's a way to separate them from the grid so we can continue that. That really is something we're going to be looking at a lot more over the next couple of years, particularly as the threats around this world start to come right back to the United States and particularly the threats to the commercial power grid.

**Moderator:** Great comments, Lucian.

Any other questions? If not, please join me in thanking the panel members for taking time.

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