



**DEPARTMENT OF THE AIR FORCE**

**PRESENTATION TO THE**

**UNITED STATES SENATE**

**FIELD HEARING**

**DUBUQUE REGIONAL AIRPORT**

**SUBJECT: AIR FORCE ENERGY STRATEGY FOR THE 21<sup>ST</sup> CENTURY**

**STATEMENT OF: MR. KEVIN W. BILLINGS  
DEPUTY ASSISTANT SECRETARY  
ENVIRONMENT, SAFETY AND OCCUPATIONAL  
HEALTH  
UNITED STATES AIR FORCE**

**AUGUST 27, 2007**

**NOT FOR PUBLICATION UNTIL RELEASED  
BY THE COMMITTEE ON FINANCE  
UNITED STATES SENATE**

**WITNESS STATEMENT OF  
MR. KEVIN W. BILLINGS  
DEPUTY ASSISTANT SECRETARY  
ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH  
BEFORE THE  
SENATE COMMITTEE ON FINANCE FIELD HEARING**

**AUGUST 27, 2007**

Senator Grassley, thank you for the opportunity to appear today to outline the Air Force Energy Strategy for the 21<sup>st</sup> Century, and to describe some of our recent achievements. I am Kevin Billings, Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health.

The Air Force is engaged every single day in global operations, fighting the Global War on Terror, defending our homeland, providing strategic deterrence, and giving our nation unparalleled Global Vigilance, Reach and Power. Air Force global expeditionary air, space and cyberspace forces provide **vigilance** that is persistent, focused and predictive; **reach** that is reliable, rapid and agile; and **power** that is precise, stealthy and decisive.

Your Air Force has been in continuous combat operations for over 16 years – since the beginning of Operation DESERT STORM in 1991. We fly over 250 daily sorties in Iraq and Afghanistan and flew over 80,000 sorties in the past year. Since September 11, 2001, we have flown over **48,000** sorties in America's skies to protect our homeland.

Air Force global operations require a tremendous amount of energy – we consumed almost 2.6 billion gallons of aviation fuel in fiscal year 2006 at a cost of almost \$5.8 billion, with a total energy bill exceeding \$7 billion when we include energy to operate our bases and fuel for our ground vehicles.

The United States currently imports nearly 60% of its petroleum products -- and that number is expected to rise to 68% by 2030. Our top six foreign suppliers of crude oil to the United States are Canada, Saudi Arabia, Mexico, Venezuela, Nigeria, and Iraq. Over half of the world's oil supply travels through the Straits of Hormuz and another quarter of the world's supply travels through the Straits of Malacca. These are two of the world's most salient shipping choke points.

The growing economies of China, India and the rest of Asia are expected to continue to increase world-wide petroleum demand. The Chinese have already spent over \$45 billion since 2000 on oil and gas exploration throughout the world.

For multiple reasons, including the global energy environment, the Air Force and is a primary driver behind the Air Force energy strategy -- to reduce demand, increase supply, and change the culture within the Air Force so that energy is a consideration in everything we do.

The Air Force has an aggressive facility energy conservation program that achieved an impressive 30% reduction in energy use over the past 20 years. Your Air Force is the Federal Government's largest purchaser of "green power" and the fifth largest in the nation overall. In fact, two of our bases, Dyess AFB in Texas and Fairchild AFB in Washington are powered nearly 100 percent by green power off the grid. Thirty-seven of our bases purchase green power.

We are a leader in renewable energy. At Nellis AFB in Nevada, in a partnership with Powerlight, a subsidiary of Sun Power Corporation, we are installing North America's largest solar photovoltaic array. When operational at the end of this year it will produce over 14 megawatts of clean, renewable, power. We have installed over 7 megawatts of renewable energy at our other bases throughout the Air Force.

Nearly 8 percent of our diesel fuel is B20, which is a blend of 80 percent conventional diesel and 20 percent renewable bio-fuels. Today, 59 Air Force Bases are dispensing B20, and 15 bases are dispensing E85, with a 16<sup>th</sup> E85 station opening this week at FE Warren AFB, Wyoming. We have over 5,200 FlexFuel vehicles in our fleet.

Mr. Chairman and members of the Committee, I am sure you are most interested in the Air Force's plan to test, certify and fly using a synthetic aviation fuel. Air Force lore has it that Secretary Wynne was walking among rows of fighter jets and bombers one day when he heard a voice. That voice from the field of airplanes said, "If you certify them, they will come."

Much like the legendary Ray Kinsella, Secretary Wynne believes that by doing something out of the ordinary, the Air Force can make good things happen.

The Air Force Synthetic Fuels Initiative is a key part to our energy strategy. The Air Force is committed to certifying our entire fleet of aircraft to fly on a synthetic aviation fuel blend by early 2011. The Air Force goal is to cost effectively acquire one half of our contiguous United States (CONUS) aviation fuel via a synthetic fuel blend utilizing domestic feedstocks and produced in the United States by 2016. It is our intent to require that the synthetic fuel purchases be sourced from suppliers with manufacturing facilities that engage in carbon dioxide capture and effective reuse. Based on FY06 consumption rates, this equates to approximately 400 million gallons of synthetic fuel per year beginning 2016.

Last year the Secretary of the Air Force directed Air Force Materiel Command to take on a project to procure synthetic fuel, static ground test the fuel on engine test stands at the Oklahoma City Air Logistics Center at Tinker AFB, Oklahoma City, Oklahoma, and, if ground tests were successful, conduct an aviation flight demonstration at the Air

Force Flight Test Center, Edwards Air Force Base, California. To ensure maximum crew safety in the first US military jet aircraft powered by domestically manufactured synthetic liquid hydrocarbons, the test was conducted using a 50/50 blend of conventional crude oil refined jet fuel and a synthetically manufactured product. The first three flights were arranged for safety purposes so that only a single pod of two engines were powered by the SynFuel blend. The remaining six engines of the aircraft used conventional crude oil refined jet fuel.

The initial flight took place on September 19, 2006, and there have been a total of four flight tests, the most recent occurring on December 15, 2006. The last flight in the test series was flown by the Commander of the Air Force Flight Test Center with all eight engines fueled by the SynFuel blend, thus fully demonstrating the feasibility of using synthetic fuel for military aviation use.

In January, the jet was flown to Minot AFB, North Dakota for a series of cold weather engine starting tests. Those tests have been completed.

The jet was returned to the Air Force Flight Test Center, Edwards AFB, California, and the jet was engines removed and disassembled for inspection. The inspections have confirmed that there are no deleterious effects of using a Synthetic blend jet fuel in military aircraft. On August 8, 2007 the Secretary of the Air Force and the team responsible for the testing and certification of the fuel and aircraft signed a certificate fully authorizing the use of a synthetic fuel-blend in the B-52.

This aviation flight demonstration was the first step towards achieving the Air Force's goal. More flight-testing and airworthiness certification of the fuel is required to meet the Air Force goal of certifying the entire inventory of aircraft for operations with a Synthetic Fuel-blend by early 2011.

The Air Force established a Program Management Office for the Synthetic Fuel program on August 20<sup>th</sup> of this year and it is now taking the work of our scientists and engineers on the B-52 and using it to create a process to expedite the certification of the remainder of the fleet.

Following the successful conclusion of the B-52 certification the Air Force will begin testing the C-17 and the B-1 engine this Fall. The C-17 was chosen because its high-bypass engines are derivatives of the engines on a Boeing 757. In this respect, the testing will coincide with the work being done by the engine manufacturers with the commercial airline industry. The B-1 engine tests will be conducted this November and the work will focus on the augmenters and afterburners that will be critical in determining how synthetic fuel will operate in fighter aircraft. The fuel for tests this year was awarded to Shell Houston and we expect 281,000 gallons of synthetic fuel to be delivered later this week. We are excited about the testing and certification program for the Air Force fleet and as we move forward we will continue to share the information we develop with the Army and Navy.

We know we cannot accomplish our vision without the full support and cooperation of industry, and specifically with respect to aviation operations, without the support of the Federal Aviation Administration (FAA). We have partnered with the industry's Commercial Aviation Alternative Fuels Initiative (CAAFI) throughout our planning and flight testing. We continue to work with CAAFI, the engine manufacturers, the Air Transport Association, the Airports Council International – North America, and the Aerospace Industries Association, and the FAA. The collective goal of these meetings is to ensure we build a road map to early and successful adoption of SynFuels for the commercial aviation transportation sector.

To better understand the industry, we have undertaken two additional efforts:

-- First, at the request of the US Navy and the US Air Force, the Defense Logistics Agency conducted an extensive SynFuels market survey through a Request for Information (RFI). The results of this RFI have given us the confidence to know that as we certify our aircraft for use of SynFuels, a US manufacturing capacity will evolve by the next decade.

-- Secondly, we have partnered have funded a limited study with the Department of Energy and the Environmental Protection Agency in an effort to develop a better understanding of quantify the technical, environmental, and economic issues of one limited portion of the synthetic fuels area: the addition of biomass to the coal feedstock to further reduce CO2 emissions.

On a technical note, SynFuels manufactured by the Fisher-Tropsch process have greatly reduced levels of sulfur compounds (SOx) and very little particulate matter when operated in a modern gas turbine engine.

The Air Force recognizes there is an environmental challenge with carbon management (green house gas emissions) associated with the production and use of SynFuels. The Air Force believes the challenge can and should be overcome with the new technology currently being designed and developed in government laboratories and industry today. The Air Force plans to source its supply of domestically produced synthetic aviation fuel with producers who substantially capture and reuse or reform the CO2 to make it a viable product for future use. This also will result in a product that can be sold and will further reduce the cost of CTL fuels.

The Air Force is working with DOE to study the addition of biomass to the coal feedstock to further reduce CO2 emissions. This effort is expected to provide useful

information on the production of a potentially cleaner domestic coal with domestic biomass that has the potential to reduce CO2 emissions far below current oil refineries in the United States.

One day after the Air Force had certified the fleet, Secretary Wynne was once again walking among the rows of fighter jets and bombers and he meets a developer of synthetic fuel, and the developer asks Secretary Wynne "Is this heaven?" And Secretary Wynne responds, "No, it's Iowa."

Senator Grassley, the Air Force appreciates the opportunity to provide an overview of our energy initiatives and the testing and certifying of synthetic aviation fuels in our aircraft fleet. I look forward to answering your questions at this time.