

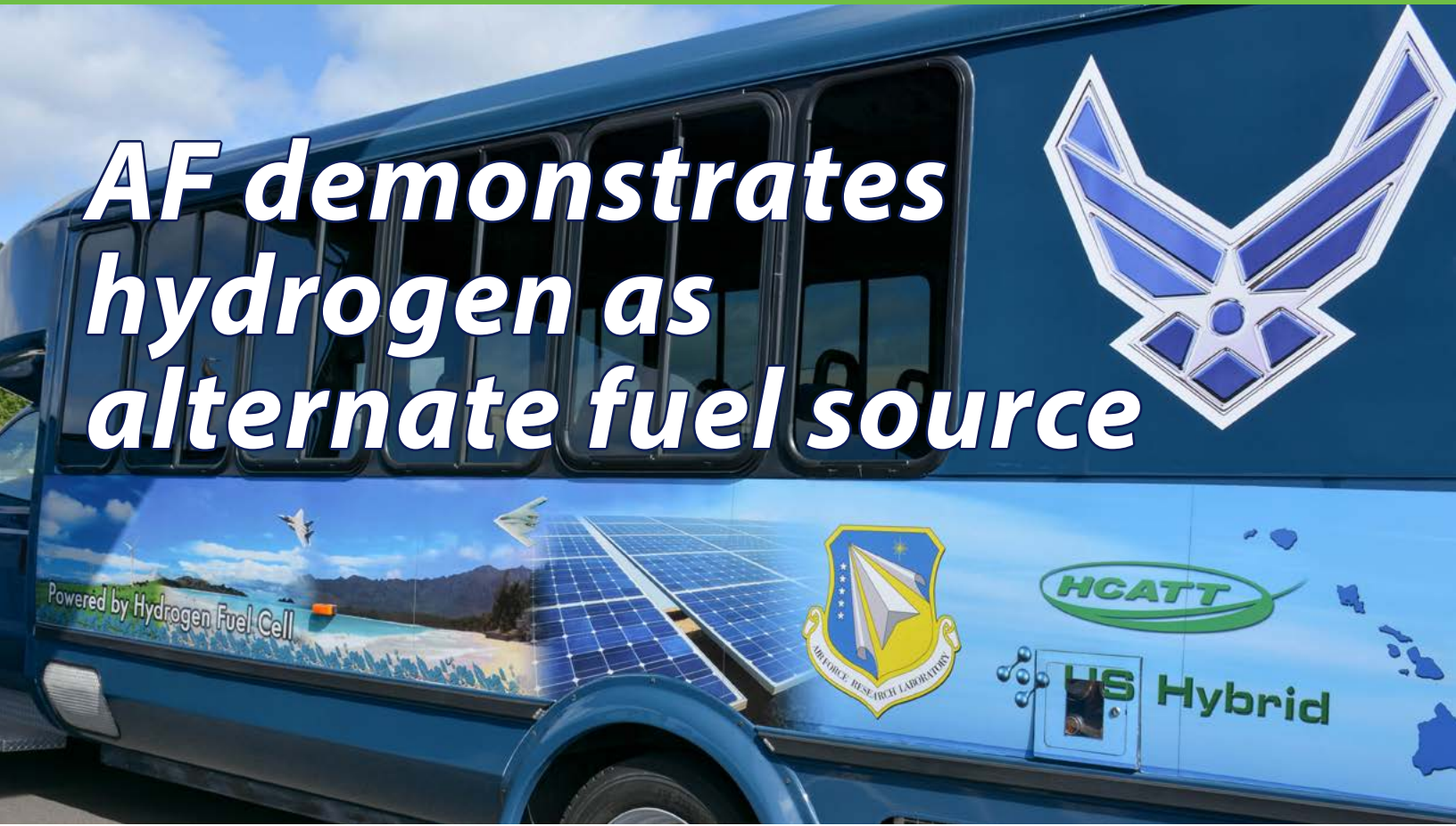
"Leading the Way in Delivering Air Force Installation Energy Assurance"

ENERGY | express

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AF demonstrates hydrogen as alternate fuel source



By Brian Garmon
AFIMSC Public Affairs

TYNDALL AIR FORCE BASE, Fla. - The U.S. Air Force is demonstrating hydrogen as an alternate fuel source at Joint Base Pearl Harbor-Hickam, Hawaii.

In a recent visit to Hickam, members of the Air Force Civil Engineer Center's Energy and Operations directorates were given a tour of the installation's hydrogen production facility and shown several of the vehicles that use this alternative fuel. This project, with

assets housed at the 647th Logistics Readiness Squadron and with the Hawaii Air National Guard, is part of a cooperative agreement between the Air Force Research Laboratory and the Hawaii Center for Advanced Transportation Technologies (HCATT). This state organization supports the Hawaii Air National Guard, the National Guard Bureau, and the U.S. Air Force. It is tasked to demonstrate hydrogen technology and its potential applications within the Department of Defense.

In areas like Hawaii, where renewable energy resources account for a large portion of the grid's total electrical capacity, intermittent renewable energy resources, such as wind and solar, become less desirable. Continual sources of renewable energy, such as hydrogen, become an important focus in the shift towards cleaner, cost-effective energy. This is due to the need for a consistent supply of power to meet electrical load demands.

This hydrogen project has been in place

continued on pg. 2

- In this issue:
- Oshiba assumes leadership of AFCEC
 - Project to land Airmen in 'hot water'
 - A letter from Mark Correll, SAF/IEE



Hydrogen *continued from pg. 1*

for over a decade, originally installed in 2006 as a mobile hydrogen production, compression, storage, and dispensing unit, and was upgraded in 2010. Both systems were set up to support all DoD hydrogen vehicle testing, to include both hydrogen internal combustion and fuel cell vehicles. Some of the hydrogen vehicles currently supported by this station include a 25 passenger crew bus, a MJ-1E fighter weapons loader and a U-30 heavy aircraft tug.



This U-30 heavy aircraft tug is powered by a hydrogen fuel cell. This vehicle is part of a demonstration of hydrogen as an alternative fuel source at Joint Base Pearl Harbor-Hickam, Hawaii. (U.S. Air Force photo by J. Brian Garmon)

"HCATT's partnership with AFRL, AFCEC, NGB, HIANC, and the invaluable support from Hawaii Senator Brian Schatz, are key to the program's success in demonstrating the versatility of hydrogen fuel cell vehicles within DoD," said Stan Osserman, director of HCATT. "These proofs of concept not only provide alternate vehicle choices for the Air Force's flight line of the future, but also will help the State of Hawaii in its effort to increase hydrogen usage across the islands."

This project not only supports the Air Force's goal of increasing its renewable energy usage, but also aligns with the Hawaii Clean Energy Initiative, launched originally in 2008. HCEI seeks to achieve the nation's first 100 percent renewable portfolio standards by 2045 and to reduce petroleum use in Hawaii's transportation sector.

"AFCEC is extremely interested in developments in clean and

efficient energy production and storage that may enhance energy resilience for critical Air Force missions," said Mike Rits, AFCEC subject matter expert on renewable energy and energy resilience. "Efforts to test and expand that portfolio, such as this one, help the Air Force make the most lifecycle cost-effective decisions toward that end."



Director of the Hawaii Center for Advanced Transportation Technologies, Stan Osserman, center, briefs subject matter experts for the Air Force Civil Engineer Center Mike Rits, left, and Tarone Watley, right, on the capabilities of the hydrogen electrolyzer and supported vehicles at Joint Base Pearl Harbor-Hickam, Hawaii, Dec. 12, 2017. (U.S. Air Force photo by J. Brian Garmon)

In a hydrogen electrolysis unit, water is separated into hydrogen and oxygen using electricity. This hydrogen is collected, compressed, and stored for fuel while the oxygen is either released into the air or can be collected and used in other applications. In many cases, excess electricity created during peak production by other renewable sources, such as wind and solar, can be used in this process to reduce cost and provide nearly emission-free fuel for

the fuel cells.

The collected hydrogen can then be used in hydrogen fuel cells to create electricity as needed. The hydrogen enters the fuel cell, where it has its electrons stripped by a chemical reaction. These electrons then travel through the circuit in the form of electricity and finally return to the cell, where they combine with oxygen entering from

the air and the hydrogen ions created from the initial reaction. The only byproduct of this reaction is water, which then drains from the cell.

"Hydrogen fuel cell use is growing exponentially worldwide in the private sector," added Osserman. "The DoD could benefit, on many different levels, by embracing the adaptability and scalability of hydrogen and fuel cell systems."

Oshiba assumes leadership of AFCEC

By Armando Perez
AFIMSC Public Affairs

JOINT BASE SAN ANTONIO-LACKLAND, Texas -- The Air Force Civil Engineer Center welcomed its new director during an assumption of leadership ceremony here Feb. 5.

Edwin Oshiba, a member of the senior executive service, becomes the center's third director since the organization activated in 2012. As a primary subordinate unit of the Air Force Installation and Mission Support Center, AFCEC executes civil engineering services in construction, energy, environment, housing, operations, planning, real property, and readiness and emergency management around the globe.

"Our goal is to remain resilient, adaptable and focused on sustainable solutions," Oshiba said. "I look forward to working with our CE community to ensure our engineers maintain a trained and ready force, and provide the installation and combat readiness capabilities to enable Air Force and AFIMSC core missions," Oshiba said.

The first civil engineer to take the helm at AFCEC, Oshiba commissioned in the Air Force in 1989 after graduating from Santa Clara University, California. He served in a variety of CE leadership positions at the base, major command and headquarters levels before retiring from active duty in 2015 as a colonel.

Returning to the Air Force as a member of the Senior Executive Service, he most recently served as the Air Force deputy director of civil engineers at the Pentagon. In that role, he supported the director of civil engineers in training and equipping an engineering



Maj. Gen. Bradley Spacy passes the unit flag to Edwin Oshiba, incoming director of the Air Force Civil Engineer Center during an assumption of leadership ceremony Feb. 5 at Joint Base San Antonio-Lackland. (U.S. Air Force photo by Steve Warns)

force of 51,000 and provided policy and oversight for a portfolio valued at more than \$297 billion.

"I have been very fortunate in my career, both as an officer and now as a civilian, to lead men and women in CE who are doing great things for the Air Force enterprise," he said.

As the newest director for AFCEC, Oshiba leads an organization of more than 1,900 people responsible for providing responsive, flexible full-spectrum installation engineering services. The center conducts its missions at

more than 75 locations worldwide. Oshiba plans to build on his predecessors' successes as he moves the center forward.

"I appreciate (former directors) Mr. (Joe) Sciabica and Mr. (Randy) Brown for setting the foundation for AFCEC and leading this organization to provide best-practice solutions to Airmen — anytime, anywhere," he said. "I hope to follow in their footsteps as I now lead AFCEC to be ready when called to conduct readiness operations, execute base civil engineer operations and perform facility lifecycle management."

AFCEC project hopes to land Airmen in ‘hot water’

By Brian Garmon
AFIMSC Public Affairs

TYNDALL AIR FORCE BASE, Fla. – The Air Force Civil Engineer Center is embracing innovation and a partnership with the South Dakota School of Mines and Technology (SDSMT) in an effort to bring off-the-grid electricity and hot water to Airmen in difficult deployments around the world.

Using equipment originally designed to heat residential pools, this project is exploring the possibility of deploying kit-ready solar panels along with a water heating system that could provide both electricity and the valuable commodity of hot water to assembled-in-place structures.

Due to these structures’ unique shape and construction, traditional mounting solutions for solar prove difficult to implement. The 823rd RED HORSE squadron at Hurlburt Field, Florida, constructed two small-scale K-Span buildings onsite at Tyndall to serve as a platform for testing the feasibility of this design.

Currently, once built, these structures are installed on an expeditionary electrical grid, where they serve as command centers, mess halls, maintenance facilities, and more. Fuel must be delivered to these remote sites to power them and produce hot water. By introducing this renewable solution to the deployable inventory, it could serve to reduce this dependence on transported fuel.

“Less fuel equals fewer fuel convoys which equals saving troops’ lives,” said Reza Salavani, Air Force Civil Engineer Center energy program manager, requirements and acquisition division.

Mike Tomac is a Ph.D. student with SDSMT who originally proposed this project as part of his master’s thesis along with professor Dr. David Dixon and former faculty Butch Skillman. The school then brought the proposal to the Air Force, where it was granted funding through an existing contract partnership with AFCEC.

“The most exciting part of this partnership is the ability to apply existing technology in an innovative way for the Air Force,” said Tomac. “Working with the Air Force helped tailor my education and gave me focus on innovation and implementation of projects in a real environment. It brought this applied project to life.”

In addition to Tomac’s work on his master’s degree and Ph.D., other students have also benefited from the partnership. Another master’s student

at SDSMT, Shannon Morse, is using the project for her thesis, and during set-up at Tyndall, two local high school interns from Port St Joe High School were given an opportunity to participate in the project.

In this project and others like it, the Air Force fosters strong partnerships with academia and encourages innovation around off-the-shelf tech that can find deployable solutions for Airmen and save the government countless dollars.

“Partnerships with academic institutions around the country give the Air Force access to great minds and fresh perspectives,” said Col. Tim Dodge, deputy director of AFCEC. “Harvesting the skills, knowledge, and abilities of students and faculty from around the country can ultimately benefit the warfighter downrange.”



Mike Tomac, Ph.D. student at the South Dakota School of Mines & Technology, stands near a small-scale K-Span structure used to test the viability of adapting off-the-shelf solar technology to deployable structures for the Air Force at Tyndall Air Force Base, Florida. (Courtesy Photo)

ENERGY | *expres*

A letter from Mark Correll, SAF/IEE

To the Air Force Energy Community,

February marks the two-year anniversary of the establishment of the Office of Energy Assurance (OEA), which serves as the “storefront” for Air Force energy requirements and projects. It is an exciting time for resilient energy and technological innovation for the Air Force and OEA is exploring creative solutions to meet installation energy challenges.

This year, OEA issued a request for information on Enhanced Use Leasing for natural gas and engaged in the FY2017 Environmental Security Technology Certification Program (ESTCP) call for large scale energy storage project proposals. Stay tuned as OEA continues to develop innovative energy solutions at installations across the nation by subscribing to the OEA Updates (<http://www.safe.hq.af.mil/Programs/Energy/OEA/OEA-Updates/>) newsletter. We are always striving to deliver resilient, cost competitive and clean energy solutions. With OEA’s energy assurance execution tools, we’re one step closer.

Looking to the future, August will be here soon and that means Energy Exchange 2018! I strongly encourage you to attend and learn what’s happening across the federal government and industry to improve energy and water resilience, and it also represents a great way to earn continuing education units. There will be more formal guidance coming soon, but start working with your leadership now so you can attend.

Finally, the call for the Federal Energy and Water Management Awards will be coming soon. If you know of an individual, project or program that represents a shining example of what the Air Force is doing to improve resiliency, optimize demand and assure supply, please let us know. In addition to recognizing individual career long accomplishments, we are also interested in outstanding achievements in:

- Energy and water efficiency and conservation
- Renewable energy implementation
- Sustainable practices for high-performance buildings
- Fleet and transportation management



Criteria for the 2018 nomination cycle will be posted here: <https://energy.gov/eere/femp/federal-energy-and-water-management-awards>. For questions about submitting, contact Ms. Andrea Hodges at andrea.l.hodges4.civ@mail.mil or (703) 693-3254.

Stay up to date on all things Air Force Energy with the Energy Program online, on Facebook @AirForceEnergy and on Twitter @AFEnergy.

Thanks for all the work you do and have a great February!

Mark Correll

CE DASH

<https://cs2.eis.af.mil/sites/10159/>

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