The Department of the Air Force is piloting the development of a nuclear micro-reactor to provide reliable, safe, and clean energy to installations, demonstrate the technology, and determine the viability of micro-reactors for future energy resilience initiatives for mission assurance.

DID YOU KNOW...?

Some micro-reactors are small enough to be transported by truck!

Updated as of August 2022

Micro-Reactor Pilot

Why it Matters

The Department of the Air Force (DAF) is building energy resilience capabilites as a key enabler of mission success at its installations. Concurrently, the Department of Defense (DoD) is actively working to mitigate risks posed by climate change, and seeking energy sources that are reliable, resilient, and clean.

To that end, the 2019 National Defense Authorization Act (NDAA) required the Secretary of Energy to report on a pilot program to provide resilience for DoD facilities by contracting with a commercial entity to build and operate at least one licensed micro-reactor by December 31, 2027. Building on this, Executive Order 13972, "Promoting Small Modular Reactors for National Defense and Space Exploration" outlined requirements for micro-reactor development specifically within the DoD.

What's a Micro-Reactor?

Micro-reactors are a simple and compact form of nuclear reactor capable of producing between 1-20 megawatts (MW) of electrical and/or thermal energy (Figure 1). Micro-reactors are not defined by their fuel type, can have modular components that simplify fuel transfer and mechanical upgrades, do not necessarily require water for cooling, and produce limited amounts of radioactive waste. Their simple and responsive design reduces the number of specialized operators required.

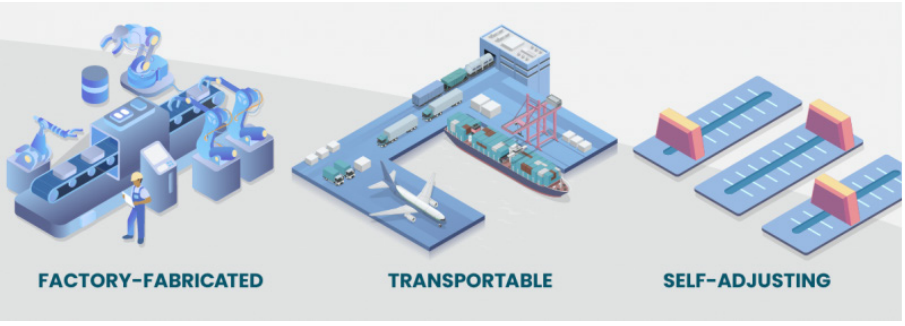

Figure 1. Micro-reactors have many benefits, and are known for their simple, fail-safe, and self adjusting designs. They have the potential to serve as redundant sources of power for DAF installations, enhancing mission assurance through energy assurance. Image credit: U.S. Department of Energy.

"Micro-reactors are a promising technology for ensuring energy resilience and reliability, and are particularly well-suited for powering and heating remote domestic military bases like Eielson AFB." - SAF/IEE Former Deputy Assistant Secretary Mark Correll

The Micro-Reactor Pilot Project

To facilitate the micro-reactor pilot program, the Office of the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Infrastructure (SAF/IEE) is working with the Air Force Office of Energy Assurance, the Office of the Deputy Assistant Secretary of Defense for Environment & Energy Resilience, the Department of Energy, and the Nuclear Regulatory Commission.

In October 2021, the DAF announced Eielson Air Force Base (AFB) as the installation to pilot its first micro-reactor. Eielson AFB was selected in part due to its resilient power needs for mission assurance, limited access to clean energy, existing energy infrastructure and compatible climate.

- *Sep 2020: Request for Information (RFI) released*
- *Dec 2020: RFI responses received*
- *Jul 2021: Data gathering and environmental baselining site visit*
- *Oct 2021: Public Announcement of Eielson as chosen micro-reactor pilot location*
- *Fall 2021: Draft Request for Proposal (RFP) and compile environmental data*
- *March 2022: RFP reviews*
- 2022: Release RFP
- 2023: Select vendor and release Notice of Intent to Award (NOITA)*
- 2023: Begin permitting and licensing*
- 2024: Execute contract*
- 2025: Begin construction and pilot phase*
- 2026: Pre-operational testing*
- 2027: End pilot phase, enter commercial operation*

**The proposed timeline is tentative and subject to change*

What's Next

The DAF team is working to gather environmental baseline data and draft a Request for Proposal (RFP). The RFP is proposed for release in calendar year 2022.

For More Information:

Contact SAF.IEE.Workflow@us.af.mil with "Micro-Reactor" in the subject line.

Pilot project updates will be shared on https://www.safie.hq.af.mil/installationenergy/currentinitiatives/

The Department of the Air Force Installation Energy Program is committed to developing and deploying policies and guidance to ensure the enterprise is prepared to deliver energy and water whenever and wherever it is needed.

For more information:

safie.hq.af.mil/InstallationEnergy

AirForceEnergy @AFEnergy