AIR FORCE OPERATIONAL ENERGY

2023 ANNUAL REPORT

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EXECUTIVE SUMMARY

This year, Secretary of the Air Force Frank Kendall directed the Department to prepare for 'Great Power Competition.' As a former pilot, I'm focused on equipping our Airmen and Guardians with the cutting-edge tools they need to meet the challenges of a coming conflict, wherever it may be. We will face a contested environment, likely vast distances away in the Pacific Ocean, requiring the warfighter to be able to fly farther and for longer periods of time. It will demand unwavering combat power. In the Pacific, greater efficiency of our processes and platforms equals more capability for us to bring to the fight.

One thing is certain: every gallon of fuel will matter in our next conflict. **Operational Energy is mission critical.**

The Warfighter needs to be ready, and we are out of time. We must accelerate and drive change at a rapid pace. This year, our team did just that.

We focused on developing sound data, launching the Data Integration Network for Operational Energy (DINOE) and providing a centralized platform to analyze fuel use data and track program performance. This capability has allowed us to increase stakeholder collaboration and has uncovered numerous opportunities to optimize aircraft operations.

Our Mission Execution Excellence Program (MEEP) expanded to a total of 15 participating squadrons. As a result of their efforts in the program, we saved 4.8M gallons of aviation fuel or $18.6M in cost avoidance and were able to provide over $7M of incentive funds to participating wings to reward them for their great work.

In August, we selected startup JetZero to complete the next phase of the Blended Wing Body (BWB) prototype aircraft project. The effort aims to mature BWB technology and demonstrate its capabilities, giving the department and commercial industry more options for future air platforms. We saw a 2-5% decrease in fuel use per flight hour as compared to 2019 in the C-17, KC-135, and C-5. That's $95M in savings for 2023 that can be used to fuel more fight...and highlights the progress we've made in technology and process improvements over the past few years.

For Air Force Operational Energy, 2023 was a year of preparing for the challenges that lie ahead and ensuring every resource is used to its fullest potential. With fuel set to become the margin of victory in great power competition, the Department of the Air Force set out to advance initiatives that significantly increase combat capability, reduce risk in the fuel logistics supply chain, and deliver numerous benefits across the enterprise.

I'm eternally grateful for and proud of my team at SAF/IEN and our partners at the MAJCOMs, AFRL, and in industry, whose dogged efforts continue to meet the rising obstacles of the day. We look forward to an exciting year to come.

Thank you for your continued support as we accelerate change... or lose.

No fuel, No fight!

Roberto I. Guerrero
Deputy Assistant Secretary,
Air Force Operational Energy

OUR MISSION

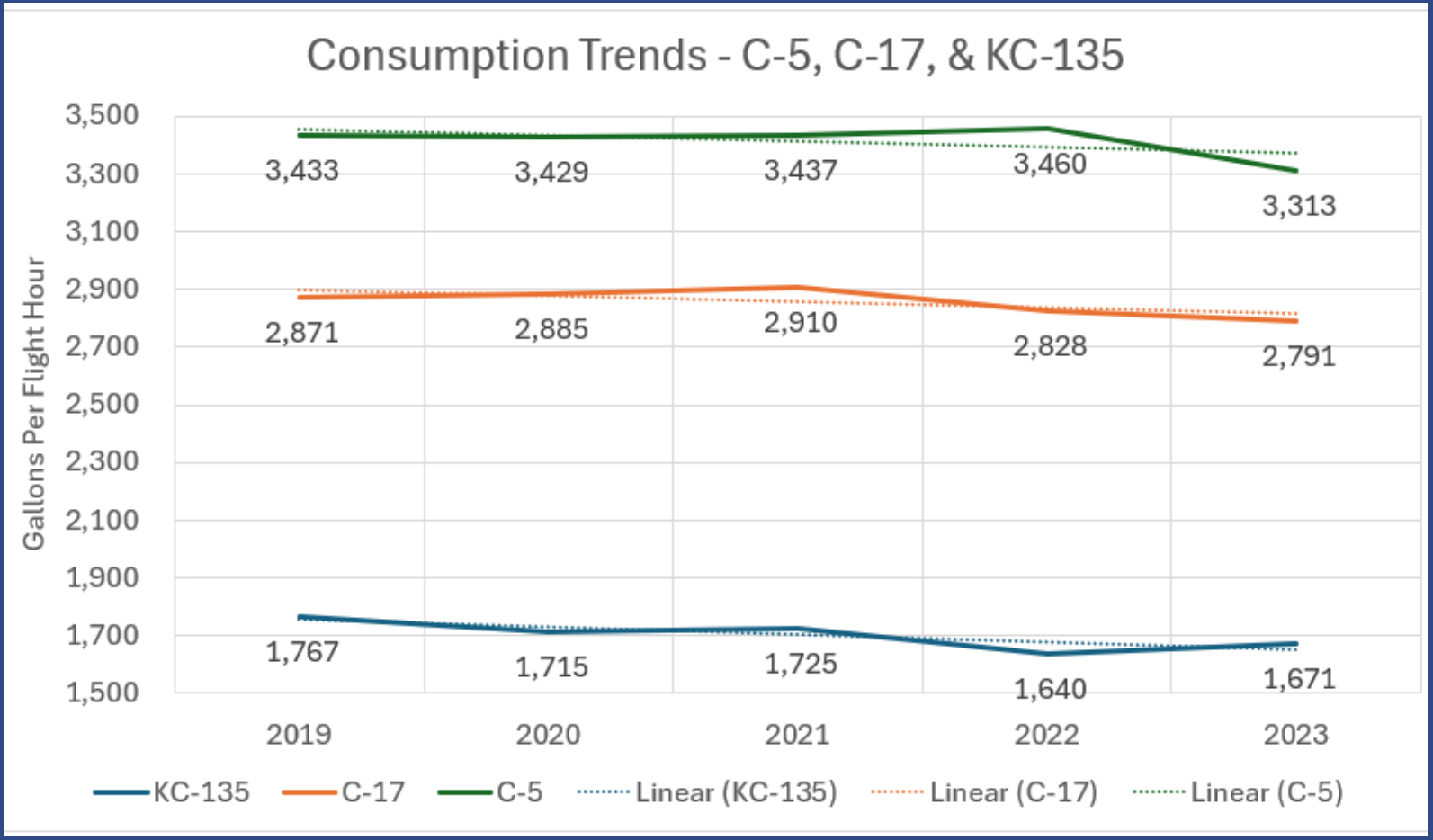
We increase combat capability and mitigate operational risk to the warfighter through energy informed solutions and technologies.

GOALS

1. **Fuel More Fight:** Improve energy intensity of operations
2. **No Fuel, No Fight:** Understand and manage risk from the fuel supply chain
3. **Accelerate to Win:** Improve planning speed and execution effectiveness
4. **Data-Informed Decisions:** Enable understanding of Operational Energy use
5. **Engage & Inform Stakeholders:** Build Operational Energy-informed culture

OUR IMPACT

The Department of the Air Force is on track to have the largest reduction in energy use and cost across the Department of Defense. We are thrilled that our work is part of the solution for maximizing combat capability across the enterprise. In recent years we've seen an overall decline in fuel consumption per hour of flight time across our mobility fleet (C-17, KC-135, C-5), resulting in a cost savings of nearly $95 million in 2023. This is in large part due to Operational Energy efforts to optimize aircraft energy use and improve our 'lethality-per-gallon.'



	2019 BASELINE	2020		2021		2022		2023	
MDS	Gal/FH	Gal/FH	Dollars Saved ($2.81/Gal)	Gal/FH	Dollars Saved ($2.40/Gal)	Gal/FH	Dollars Saved ($3.35/Gal)	Gal/FH	Dollars Saved ($4.00/Gal)
KC-135	1,767	1,715	$ 19,247,513	1,725	$ 13,481,842	1,640	$ 52,542,977	1,671	$ 44,686,327
C-17	2,871	2,885	$ (4,907,785)	2,910	$ (12,968,598)	2,828	$ 19,497,519	2,791	$ 42,345,216
C-5	3,433	3,429	$ 193,460	3,437	$ (158,447)	3,460	$ (1,427,491)	3,313	$ 7,717,824
TOTAL			**$ 14,533,188**		**$ 354,797**		**$ 70,613,005**		**$ 94,749,367**

GOAL 1: FUEL MORE FIGHT

Fuel will be the margin of victory in our next conflict, and improving the Energy Intensity of everything we do is paramount to mission success. With that in mind, the Air Force Operational Energy program is working diligently to improve energy intensity and 'fuel more fight.' We are pursuing policies, investments, and activities that increase our "lethality-per-gallon," while improving our ability to field and sustain a combat-credible force now and in the future. By reducing the energy demand of our aircraft, we can increase our range and time on-station, improve our fuel-offload capability, and boost engine performance. We do this through a variety of ways including investments in drag reduction technologies on our legacy aircraft, cargo optimization, engine sustainment, advanced platform designs, cultural change across the department, and more. By getting more "bang for our buck" with fuel, we're ensuring a stronger, more agile force for the future.

Blended Wing Body Aircraft:

One of the most impactful projects the Department of the Air Force is exploring to increase our lethality-per-gallon is the transformational design of a blended wing body aircraft which is expected to increase fuel efficiency of large aircraft by more than 30% (with today's engines). For an aerial tanker, this can equate to nearly a doubling of mission radius or offload, depending on the mission. This platform demonstration project aims to accelerate future flexibility for tanker and cargo fleets while leveraging significant private capital to maximize Department of Defense return on investment. In August 2023, Secretary Kendall announced that start-up JetZero was selected for the BWB prototype demonstration. Initial tasks on the other transaction agreement (OTA) with JetZero included systems engineering, digital engineering, and design work leading to a system requirements review occurring in early 2024. Initial hardware purchases and development of system integration labs for risk reduction activities continues. JetZero industry partners include Northrop Grumman, Scaled Composites, Pratt & Whitney, and Collins Aerospace. This project aims to complete the first flight of a full-scale BWB aircraft in 2027.

Mission Execution Excellence Program:

As part of DAF efforts to streamline operations and increase aircraft range and capability, Air Force Operational Energy, in partnership with Air Mobility Command, launched the Mission Execution Excellence Program (MEEP) in 2022, and substantially expanded the program in 2023. MEEP is a fuel savings incentivization program promoting optimized flying on heavy mobility aircraft, the largest fuel consumers in the Air Force. MEEP's overarching goal is to drive cultural change among Airmen to optimize use of aviation fuel in preparation for future conflict in a fuel-constrained environment (i.e., Indo-PACOM) with the largest point of emphasis on precise fuel planning. Additionally, MEEP encourages use of efficient flying 'best practices' through education and incentivization and, importantly, does not negatively impact mission and training requirements.

In 2023, MEEP expanded to a total of 15 Squadrons including both the C-17 and the C-5 aircraft with active-duty and AFRC participating. MEEP saved 4.8M gallons of aviation fuel which equates to $18.6M in cost avoidance in 2023. As a result of these accomplishments, Air Force Operational Energy provided over $7M of incentive funds to the Wings participating in the program. These funds will be executed on unit-level operational energy initiatives and to procure resources that improve DAF's worldwide combat capability. MEEP is one of the most cost-effective programs in our portfolio and is a significant portion of the overall climate energy intensity goal, representing approximately 1.5% of total AF energy intensity progress.

MEEP CY23 COMPETITION RESULTS

Squadron	Competition Rank	Squadron Rebate	Wing	Wing Rebate	Award Earned	Total Earned
3 AS (C-17)	1	$598,947	436 AW	$1,144,009	$600,000	$1,744,009
9 AS (C-5)	6	$545,062				
4 AS (C-17)	5	$609,661	62 AW	$1,601,147	$600,000	$2,201,147
7 AS (C-17)	1	$728,006				
8 AS (C-17)	7	$263,479				
14 AS (C-17)	12	$429,720	437 AW	$1,447,479		$1,447,479
15 AS (C-17)	11	$399,843				
16 AS (C-17)	10	$617,916				
300 AS (C-17)	13	$19,816	315 AW (AFRC)	$28,017		$28,017
317 AS (C-17)	13	$5,172				
701 AS (C-17)	13	$3,029				
21 AS (C-17)	8	$731,450	60 AMW	$1,168,662		$1,168,662
22 AS (C-5)	9	$437,212				
301 AS (C-17)	3	$147,079	349 AMW (AFRC)	$301,415	$300,000	$601,415
312 AS (C-5)	4	$154,336				
Totals		$5,690,729		$5,690,729	$1,500,000	$7,190,729

Aircraft Drag Reduction:

In 2023, we continued to collaborate with research and industry partners to develop and test several technologies that reduce drag and improve aerodynamics across our mobility fleet. One such example is Microvanes, small 3D-printed structures that attach to the aft-end of the fuselage. The fin-like shape helps redirect airflow in this high drag area, streamlining the aerodynamics and reducing overall fuel demand by approximately 1%. It is estimated that this initiative could save over $10 million annually when installed across the entire C-17 fleet. In 2024, we'll continue flight testing the microvanes in partnership with the Air Force Research Laboratory.

In 2023, one contract and four OTAs were awarded encompassing 10 drag reduction projects in seven technology areas with six different industry partners. Total value of these awards is approximately $14.5M. For example, we're working with Australian start-up MicroTau on riblet technology. Riblets are an aircraft skin applique with microstructures akin to shark skin which reduce friction drag. Analysis shows a potential fuel efficiency improvement of 4%. We're also working with Vortex Control Technology and Metro Aerospace on aft body drag reduction devices for C-130s and KC-135s, expecting up to 7% fuel efficiency improvement on C-130s and 1.5% on KC-135s. In addition, we've partnered with FlexSys and Tamarack for initial design work on an advanced C-17 winglet. Initial tasks in 2023 included aircraft specific design and configuration work, primarily via computational fluid dynamics, as well as compatibility assessments and user requirements definition.

Aircraft Engine Sustainment:

An efficient engine runs cooler, requires less maintenance, and can remain on the wing longer. In 2023, our team introduced and matured several initiatives to improve the efficiency of our engines. 2023 was the first full year that detergent was added to the engine wash process for five platforms across 36 locations, reducing fuel consumption and saving $1.84M. Additionally, with SAF/IEN's support, AFSOC extended the Nucleated Foam technology effort with a Tactical Funding Increase contract that helped bridge the gap between a Phase II and a Phase III contract projected to start in 2024 to bring this technology to CONUS AFSOC units through 2028. Thanks to this technology, AFSOC was able to improve fuel flow for the C-130J and CV-22 platforms by 0.7%. Lastly, the Nucleated Foam engine wash technology was expanded to AMC through a Phase II contract for the KC-135 aircraft at MacDill AFB. The contract was awarded in early 2023, and by the end of the year, a 11-degree improvement in the exhaust gas temperature and an average fuel flow improvement of 1.16% were observed.

Transformative Technologies: AR/VR Training:

Virtual reality technology has enormous potential for developing abilities, knowledge, and situational awareness while boosting operational readiness and optimizing fuel consumption. In 2023, we funded over $12 million in augmented and virtual reality training modules for Air Mobility Command and Air Force Special Operations Command. The modules included realistic, 3D aircraft specific training that allow flight crews the same number of hours of education while reducing wear and tear on aircraft and engines. One study of C-130J training data determined that this technology resulted in a 45% reduction in aircraft downtime and returned over 700 hours to the flightline, teaching pilots and ground crews how to optimize fuel consumption and reduce emissions during flight and maintenance.

Climate Mitigation:

Climate change is reshaping the increasingly complex global security environment. Impacts like extreme weather and environmental conditions pose new risks to our ability to train and operate effectively by potentially degrading infrastructure, interrupting fuel supply, and more. It impacts our ability to maintain readiness, access strategic locations globally, and execute the operational mission. In July 2023, the Department of the Air Force published the next phase of our Climate Action Plan, the Climate Campaign Plan.

In July 2023, the Air Force launched its detailed Climate Campaign Plan. This plan is the next phase of the 2022 Climate Action Plan and outlines specific steps and measurable goals to boost combat readiness and capability, reduce supply chain risks, improve operational planning and cut greenhouse gas emissions.

Climate Campaign Plan Objectives:

Objective 3.1: Improve Operational Energy Intensity

- KR 3.1.1: Operational energy intensity of Air Force flying missions increased 5 percent by FY27 and 7.5 percent by FY32 through standardized use of aircraft drag reduction technologies, modern software scheduling tools, and enhanced engine sustainment practices.
- KR 3.1.2: Development and testing of a full-scale blended wing body prototype completed by FY27.

Objective 3.2: Adopt Alternative Energy Sources

- KR 3.2.1: Completed successful pilot of drop-in compatible sustainable aviation fuel at two operational Air Force locations by FY26, where 10 percent of all purchased aviation fuels consist of sustainable aviation fuel blends at the same or less cost than traditional aviation fuel. The pilot project will validate operational, infrastructure, and logistical requirements for blending and quality control in the use of sustainable aviation fuel.

GOAL 2:
NO FUEL, NO FIGHT

Fuel is a cornerstone of our mission success. It's a necessary component of nearly every aspect of operations – yet it often is a target for enemy attacks and poses a serious threat to the warfighter. Our goal is to better understand and integrate energy and fuel logistics into wargaming, training, and planning to manage and mitigate this risk where possible. By improving tanker aircraft availability and performance through initiatives that improve efficiency and scheduling, we can better reduce risk to operations from contested logistics in austere and distant environments.

Tanker Readiness:

In 2017, the Air Force introduced the innovative digital tanker planning tool, Jigsaw, which drastically streamlined the process of scheduling aerial refueling missions in the CENTCOM Combined Air Operations Center (CAOC). Simultaneously, it elevated the effectiveness of each sortie, enhancing Air Force efficiency to meet mission demands while curbing fuel consumption and minimizing aircrew deployments.

Building on this success, in 2023, we remained steadfast in our support and investment in Jigsaw's auto-planning capabilities. These endeavors yielded tangible results, with a remarkable 3.6% reduction in fuel consumption realized in real time, equating to a substantial cost avoidance exceeding $3.7 million over the fiscal year. Such sustained dedication and the potential for further enhancements in Jigsaw and other automated planning tools promise to bolster Air Force tanker readiness, while concurrently reducing fuel usage and mitigating risk.

Energy-Informed Wargaming:

Realistically addressing operational energy challenges helps inform leadership decisions essential to achieving desired levels of lethality, readiness, and interoperability. Through wargaming and analysis, we continue to analyze how fuels and energy logistics support requirements impact generating and sustaining sorties while under attack in a highly contested environment. Results from the Air Force's Futures Game and Long Duration Logistics Wargames highlighted the criticality of energy distribution infrastructure and the necessity for energy planning across all phases of an operation. Joint-service wargames and studies allow participants to analyze the fuel supply network in an energy-constrained environment and evaluate how energy demand reductions can reduce risk to operations. We funded three bulk fuel enhancements for Air Force Material Commands Integrated Sustainment Wargaming Analysis Toolkit to ensure that our logistics and operations personnel have the data analytics capabilities necessary to capture the bulk fuel supply chain impacts to sortie generation.

Modeling and Simulation:

Through modeling and simulation tools, we also increased our awareness of future energy requirements and the potential for fuel supply gaps, disruptions, and adversary threats. We have partnered with Air Force Material Command to leverage the Combat Support Planning Execution and Control (CSPEC) tool to model fuel distribution impacts associated with loss of Air Force mobile refueling units due to funding shortfalls. We are also evaluating how the base level fuels distribution network may need to evolve as we think about Collaborative Combat Aircraft refueling support. Additionally, we are working with multiple Combatant Commands and Major Commands to develop methods to analyze our strategic energy posture and the unique theater challenges to inform infrastructure and capability investments that enhance operational readiness.

Pilot Training Transformation:

Collaborative efforts between AETC and SAF/IEN continue to forge the cultural change of an energy informed force, increase pilot production, and provide more lethality per gallon for the warfighter. In 2023, Air Education and Training Command (AETC) embarked on an unprecedented update to formalized flying training that leverages technology to increase both the efficiency and quality of training. Cutting edge immersive and adaptive training technology, such as Air Mobility Fundamentals – Sim Only (AMF-S) and a new Fighter Bomber Fundamentals (FBF) course restructure, has been pivotal to increasing training efficiency, reduced maintenance and flying hour requirements, while providing more training capacity per gallon.

The AMF-S program for mobility aircrew reduced actual aircraft training flights by 30 flight hours. The FBF course restructure merged the current T-38 fighter bomber and introduction to fighter fundamentals (IFF) phases into a single and shortened course of instruction. The initial FBF small group try-out successfully graduated 10 students in January 2024. The initial success and continued efforts to leverage the synthetic environment and immersive technology/simulation will continue to streamline training, reduce the number of actual aircraft hours required to be flown and lay the foundation for the fielding of the T-7A jet that is scheduled to replace the T-38.

GOAL 3: ACCELERATE TO WIN

We know we must innovate faster in order to maintain combat dominance as an Air Force. In 2023, we continued to collaborate with stakeholders across the DoD and industry to implement efficient best practices, support modernized information systems and software applications, and collect and analyze data to optimize mission planning and execution.

Mission Planning and Execution Optimization:

Gone are the days of using whiteboards to plan flying missions. We invested in 21st century planning software to optimize how we schedule aircrew to improve readiness and allocate aircraft to best accomplish mission requirements. Puckboard, a real-time collaborative squadron operations platform, provides scheduling capability to aircrew anywhere in the world, on or off the DoD network, and is now available to over 24,000 service members and 550 organizations, and counting. Puckboard integrates digital forms with programs of record and aims to increase training events accomplished per gallon of fuel consumed through its AI Solver, now deployed to users in select squadrons for final testing and evaluation. Additionally, in 2023, we continued to enhance the tanker planning tool Jigsaw with optimization and auto-planning features now integrated into the Air Operations Center, further streamlining aerial refueling schedule generation. The automation capability will save precious time: reducing planning time to seconds or minutes rather than hours and increase scheduling efficiency by at least 10% over the baseline. This is equivalent to supplying fuel to approximately 250 aircraft with 5 fewer tankers, enabling crew reallocation and saving approximately 400,000 gallons of fuel per week.

We are also working to optimize cargo loading and planning of global airlift missions with partners in Air Mobility Command and the Air Force Institute of Technology. By better utilizing allowable cargo space, the DAF can use fewer aircraft to accomplish the same mission. For example, we are working with Air Force Research Laboratory's Future Force Energy and Power Office to build and test the Vertical Stacking Pallet prototype, an airman-developed technology that allows cargo to be stacked vertically within mobility aircraft, enabling more efficient use of cargo space.

Long Range Planning:

We continued funding and workflow integration support to AMC's aircrew and aircraft allocation software tool: Magellan. This tool optimizes how the Air Force allocates mobility aircraft for missions over extended time periods which gives operational planners more visibility for long-term planning. It enables planners to deconflict recurring missions and high-demand periods and optimizes the pairing of tanker aircraft with receivers. In 2023, SAF/IEN liaisons guided integration of air operation center airlift and air refueling planners and maintenance schedulers for increased collaboration and smoother workflows. Additionally, they added visualization and filtering capabilities to the tool making it more effective for users.

Real Time Decision Advantage:

SAF/IEN continued funding and subject matter expertise support to Air Mobility Command (AMC) and its 618th Air Operations Center (AOC) at Scott Air Force Base – the Department of Defense's largest and only global AOC – to leverage Natural Language Processing (NLP) and Artificial Intelligence (AI). These tools transform the immense amount of unstructured data that continuously flows through the AOC into structured, usable data for the operator. The 618 AOC's integration of AI is part of the Next Generation Information Technology for Mobility Readiness Enhancement initiative, or NITMRE, which itself is part of Air Mobility Command's modernization efforts. NITMRE focuses on transforming Command and Control (C2), enhancing the U.S. Transportation Command's ability to project, connect, maneuver, and sustain the joint force through a variety of mobility operations. Ultimately, it rapidly connects the enterprise with information used for critical decisions along with real-time data displays saving both time and energy during mission planning and execution.

GOAL 4: DATA-INFORMED DECISIONS

We need good data to make good decisions. Our data analysis capabilities and technologies facilitate greater visibility into Air Force aviation fuel use, increase stakeholder collaboration, and have uncovered numerous opportunities to optimize aircraft operations. We can now assess how energy optimization affects combat capability in warfighting scenarios. We have demonstrated that employing more efficient air refueling assets not only decreases fuel demand and sortie requirements, but also enables greater fuel offload. In some cases, the benefits may extend beyond efficiency gains for tankers, resulting in an increase of warfighter effectiveness and allowing greater capacity to support force generation and critical deployment timelines.

DINOE:

In 2023, we launched the Data Integration Network for Operational Energy (DINOE) to enable data-driven decisions to build a more lethal force capable of sustaining combat effectiveness in environments with contested logistics as well as saving resources in training and routine operations. DINOE's goal is to maintain continuous analytics representing 90% of total Air Force fuel use. This objective supports other goals which include, improving energy intensity of operations, managing risk from the fuel supply chain, accelerating decision cycles, and building an energy-informed culture.

DINOE pulls data from GDSS, G081/REMIS, Puckboard logging (Platform One), ARMS, PEX (secondary), GTIMS (secondary), MFOQA (ADADS2), ASIMIS (backup to ADADS2), and DLA to join sortie-level fuel use, aircraft performance, and mission context data to support the operational energy project lifecycle.

What's more, DINOE enables enterprise-level tracking and monitoring of our projects and initiatives throughout their lifecycle. This includes ideation and funding advocacy for new or otherwise pre-transition projects, tracking funds and obligation rates through the project lifecycle, and tracking performance once projects or initiatives are implemented. It is especially useful for identifying cost savings that may be recovered through the Operational Energy Savings Account. Data for initiatives is unique to the program and not found in other sources.

Executive Decision Model:

Our team championed the Executive Decision Model (EDM), a predictive analytics tool that Air Education and Training Command utilizes to address a broad scope of Operational and Programmatic needs for AETC senior decision-makers and operational wing commanders. EDM is utilized to simulate flight training operations with respect to aircrew training throughput, aircraft readiness, and energy (fuel) optimization. Examples of analysis include aircraft maintenance capacity, aircraft fielding plans (T-6/T-7 transition, F-35 fielding, etc.), annual programmed flying training requirement forecast, and manpower/instructor pilot utilization to increase pilot production and maximize training capacity per gallon of fuel.

GOAL 5: ENGAGE AND INFORM STAKEHOLDERS

It is not possible to create an energy-informed Department of the Air Force without the support and understanding of our Airmen and Guardians. Our team works diligently throughout the year to bolster engagement with and tell the story of the Operational Energy Program to our various stakeholders. We do this through our strategic engagement efforts including training and education, incentive programs, leadership engagements, targeted content, cultural change initiatives and more.

Education and Training:

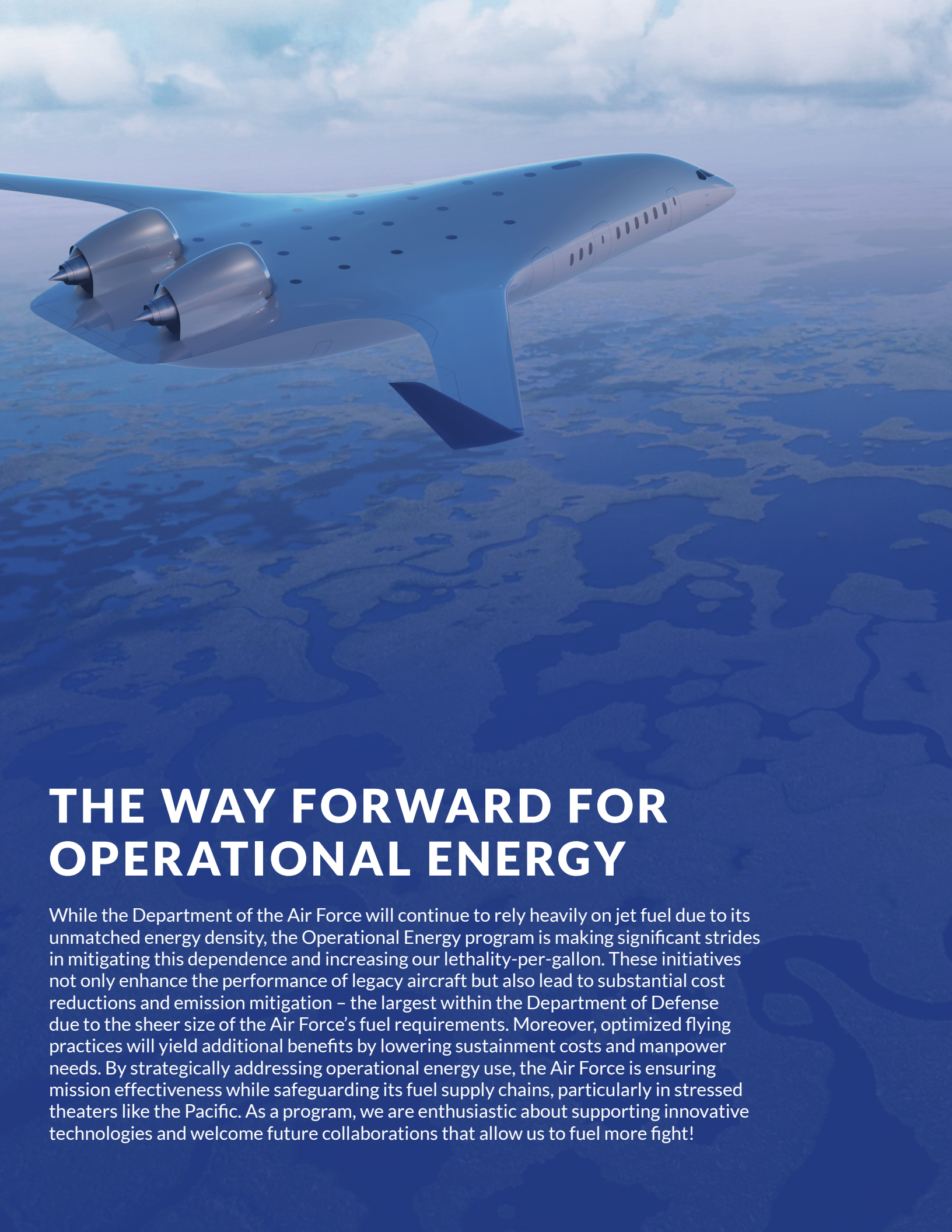
Our Education & Training efforts reached new milestones in 2023. We chartered two Memorandum of Agreements (MOA) with the United States Air Force Academy (USAFA) and Air Force Institute of Technology (AFIT). The USAFA MOA targets senior design research to investigate Operational Energy problem sets and allows for cadets to intern with SAF/IEN during the summer to accomplish additional research. The AFIT MOA allows for focused studies and research opportunities regarding operational energy within AFIT's Supply Chain Analytic Degree and for the Advanced Study of Air Mobility (ASAM) course.

In coordination with AFIT, we also developed an Operational Energy Hub on AFIT's online platform, AVOLVE. The OE HUB will contain operational energy related research papers from Air University students, as well as educational videos and learning paths. The OE Hub is easily accessible for any DoD user and will serve as a starting point for all OE focused research.

Finally, we ensured that Operational Energy became a part of the CSAF's Strategic Studies consortium and worked closely with the Air University to identify an opportunity to include an OE focused elective for Squadron Officer School resident students.

Strategic Communications:

Our strategic communications strategy, aligned with the National Defense Strategy and Department of the Air Force initiatives, educates Airmen, Guardians, leadership and Congress on operational energy's critical role in combat capability and readiness. Through targeted integrated communications campaigns and messaging strategy, media relations, content development and on-the-ground support for our senior leaders, we motivate our audiences to adopt energy-informed practices throughout their mission. Subject matter experts embedded at key commands (AETC, AFSOC, AMC/TACC, PACAF) provided additional direct support and advocated for operational energy initiatives.



THE WAY FORWARD FOR OPERATIONAL ENERGY

While the Department of the Air Force will continue to rely heavily on jet fuel due to its unmatched energy density, the Operational Energy program is making significant strides in mitigating this dependence and increasing our lethality-per-gallon. These initiatives not only enhance the performance of legacy aircraft but also lead to substantial cost reductions and emission mitigation – the largest within the Department of Defense due to the sheer size of the Air Force's fuel requirements. Moreover, optimized flying practices will yield additional benefits by lowering sustainment costs and manpower needs. By strategically addressing operational energy use, the Air Force is ensuring mission effectiveness while safeguarding its fuel supply chains, particularly in stressed theaters like the Pacific. As a program, we are enthusiastic about supporting innovative technologies and welcome future collaborations that allow us to fuel more fight!

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