



RAF MILDENHALL ENERGY MANAGEMENT PLAN 2011



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Forward

The RAF Mildenhall Energy Management Plan serves as the operational framework for all military and civilian personnel in communicating the overall DoD and Air Force energy goals, Objectives and metrics to the base level. This plan aligns with the goals outlined in the Air Force Strategic Plan, as they apply to the mission performed at RAF Mildenhall. Where applicable, Air Force energy goals, objectives, and metrics are specified in the plan, as well as the cross-functional governance and management structure for executing the Air Force Energy Policy stated in Air Force Policy Directive (AFPD) 90-17, *Energy Management*, dated 16 July 2009, and Air Force Instruction (AFI) 90-1701, *Energy Management*, dated 16 July 2009.

This plan creates the Energy Management Steering Group (EMSG), which is chaired by 100ARW/CV and is the primary corporate governing council overseeing Team Mildenhall's energy management program.

I cannot foot stomp more the importance of the implementation of responsible energy management by all members of Team Mildenhall and their families. Energy must be a consideration in all we do. Our goals are simple, Reduce Demand, Increase Supply and change our culture. By securing today's energy this will fuel tomorrow's mission.



X

MICHAEL F. WINTERS, Colonel, USAF
Vice Wing Commander (Chairman)

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Executive Summary

The Air Force's mission—to *fly, fight, and win...in air, space, and cyberspace*—entails operations that require a tremendous amount of energy. The Vision for the RAF Mildenhall Energy Plan—"Make Energy a Consideration In All We Do"—highlights that energy is central to all of the interdependent functional aspects of our mission execution. As such, the RAF Mildenhall Energy Management Plan aligns with the goals outlined in the Air Force Energy Plan, Air Force Strategic Plan, the Agile Combat Support Master Plan as well as the Deputy Chief of Staff for Logistics, Installations & Mission Support Strategic Plan Goal 4.6. The RAF Mildenhall Energy Management Plan supports Air Force priorities and provides links to energy goals established by the federal government.

Energy management is an evolving process that will require the systematic incorporation of new information, rigorous insertion of technological advancements, and continuous improvement of processes and practices.

The RAF Mildenhall Energy Management Plan is built upon three pillars that guide energy management. Each pillar of the Plan is equally important. The pillars of the RAF Mildenhall Energy Management Plan are as follows:

Reduce Demand: RAF Mildenhall is committed to reducing aviation, ground operations, and installation energy demand. The goals and objectives developed to reduce demand cover each of these areas and provide the framework for each executing organization.

Increase Supply: RAF Mildenhall is committed to increasing the amount of energy supplies available to enhance our nation's energy security. Where possible, RAF Mildenhall will develop and utilize renewable and alternative energy to reduce greenhouse gas emissions. The goals and objectives to increase supply target these three areas: aviation fuel, ground fuels, and installation energy.

Culture Change: Changing the Air Force culture is critical to achieving the Air Force's and RAF Mildenhall's Energy Vision. As the culture changes and the Air Force increases its energy awareness, new ideas and methodologies for operating more efficiently will emerge as airmen consider energy in their day-to-day duties.

RAF Mildenhall has established an Energy Utility Management Working Group (EUMWG) along with Energy Management Steering Group (EMSG) to develop local management controls and oversight.

This Plan developed by the EUMWG and approved by the EMSG contains key objectives, strategies and where possible key performance Indicators (KPI's) that can be used to assess progress towards meeting mandatory targets.

RAF Mildenhall Energy Management Plan has been divided into the following four cross functional areas plans.

Section 1. Infrastructure Energy Plan

Section 2. Acquisition & Technology Energy Plan

Section 3. Operations Energy Plan

Section 4. Culture Change

Team Mildenhall is proud to be a leader in USAFE's ongoing quest to use energy more efficiently through better procedures and new technologies while, at the same time, decreasing energy consumption and dependence on non renewable energy.

To address this challenge, the RAF Mildenhall Energy Plan provides a comprehensive and cohesive framework for all airmen to utilize in determining how to make energy a part of operational considerations. From developing new energy options that include secure and reliable energy alternatives to energy efficiency and conservation initiatives, the RAF Mildenhall is making great strides in shifting the culture to where energy is a major component of Air Force operations, which helps sustain mission readiness and responsiveness on a global scale.

Introduction

This plan enables cross functional co-operation to create a common holistic approach to energy management for RAF Mildenhall .

This plan outlines how Team Mildenhall leadership and all stakeholders will benchmark present energy use and focus on areas to reduce energy wastage while fostering better energy stewardship in support of our Energy Vision

Why is it so important to endeavor to reduce our energy / water consumption? It is important because it:

1. Complies with Executive Orders, Air Force Directives and other statutory requirements. (See Appendix G – Statutory and Policy Mandates and Drivers)
2. Is being a good steward for the Air Force, DoD, and the country.
3. Reduces cost for energy. (For example from 2001-2006 the air force reduced its energy by 8%, however, the cost of the energy increased by 40%. See Figure 1 - Energy Saving vs. Energy Cost increase 2001-2006).
4. And reduces our dependency on foreign oil.

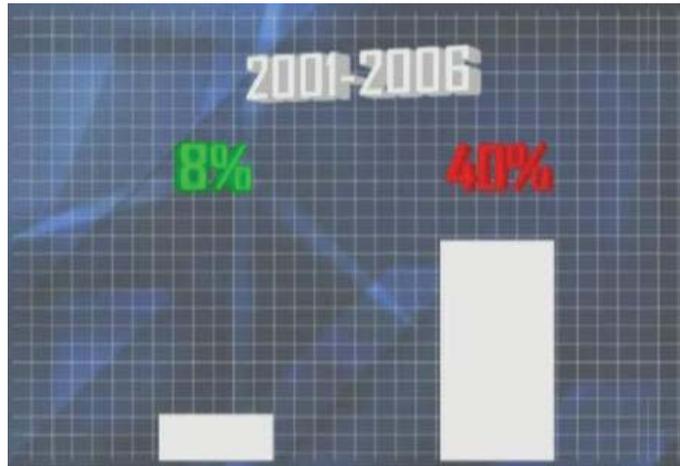


Figure 1 - Energy Saving vs. Energy Cost increase 2001-2006

Our Energy Vision

Team Mildenhall has adopted the Air Force Energy Vision:

"To make Energy a Consideration in All We Do."

Genesis of the RAF Mildenhall Energy Plan

The RAF Mildenhall Energy Management Plan was developed from the existing 2010 Air Force Energy Plan and its associated sub-plans



Figure 2 - Genesis of the RAF Mildenhall Energy Plan

Each of the Air Force sub-plans shown in Figure 2 are functionally centric and have been developed in isolation. The RAF Mildenhall plan takes all of these plans and brings combines relevant aspects for a installation specific holistic Energy Management Plan.

The structure of the RAF Mildenhall plan still affords separate sections within it, (Operations, Acquisition & Technology and Infrastructure) to help with the development and implementation of this plan.

Energy Management Leadership Management Structure and Governance

The following three management processes have been established:

1. Energy Management Steering Group (EMSG)

Energy Management Steering Group (EMSG) will convene on a quarterly basis (Late February, May, August, November). The EMSG will be chaired by Wing CC or CV and act on recommendations provided from the EUMWG. (See Appendix A – Key Energy Management Personnel). The EMSG will oversee the implementation of this plan and review the on-going progress which will include Key Performance Indicators (KPI's). Meeting minutes will be prepared, published for each scheduled meetings and forwarded to HQ USAFE/A7PO (See Appendix F – EMSG Meeting Minutes)

2. Energy Utility Management Working Group (EUMWG)

Energy Utility Management Working Group will convene on a quarterly basis (Early February, May, August, November) and consist of key energy user stakeholders (See Appendix A – Key Energy Management Personnel).

This group will review all energy related matters and review progress towards compliance with statutory mandates (See Appendix G – Statutory and Policy Mandates and Drivers). The group will develop ideas and processes to reduce energy consumption which will be briefed at the EMSG for review and approval. Meeting minutes will be prepared and published for each scheduled meeting.

3. Functional Energy Champions

This plan identifies Functional Energy Champions for the four primary sections of this plan. These are:

| Plan Section # | Section Title | Office of Primary Responsibility (OPR) |
|----------------|--|--|
| Section 1 | Air Force Infrastructure Energy Plan | 100 CES |
| Section 2 | Air Force Acquisition & Technology Energy Plan | 100 CES |
| Section 3a & b | Operations - (Aviation) Energy Plan | 100 OG / 100 MXG |
| | Operations – (Ground) Energy Plan | 100 LRS |
| Section 4 | Energy Awareness and Culture Change | 100 ARW/PA |

Table 1 - Functional Energy Champions

Strategic Approach

The Air Force's and RAF Mildenhall's strategic approach to reduce energy is graphically represented in Figure 3 and expanded in Figure 5. Major goals of the program are supported by three strategic Pillars, each representing a focused area of energy management. Action within each Pillar will be required to produce the broad energy reduction goals mandated by the various federal laws, policies, statutes, etc. (see Appendix G – Statutory and Policy Mandates and Drivers).

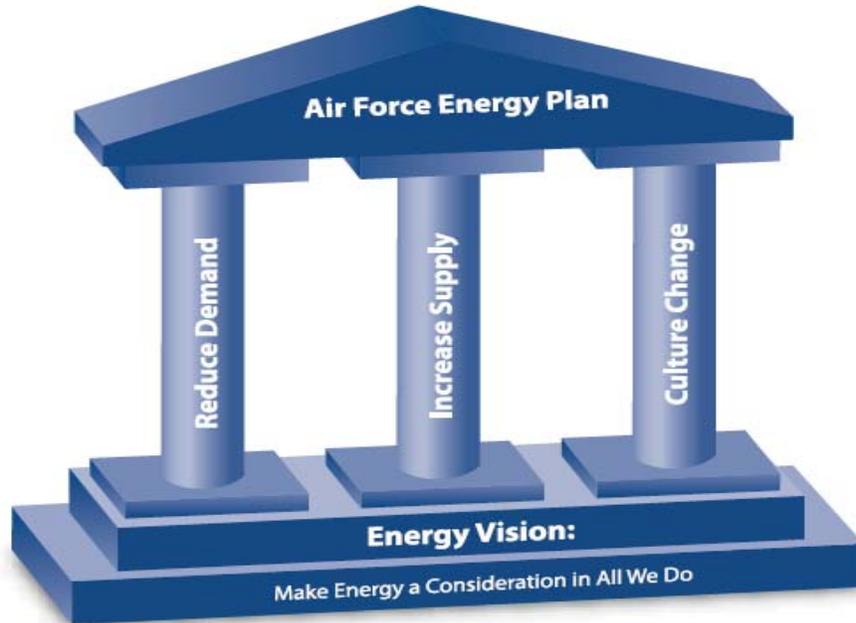


Figure 3 - Air Force Energy Plan Pillars

1. Reduce Demand

RAF Mildenhall is committed to reducing aviation, ground operations, and installation energy demand. The goals and objectives developed to reduce demand cover each of these areas and provide the framework for each executing organization.

2. Increase Supply

RAF Mildenhall is committed to increasing the amount of energy supplies available to enhance our nation's energy security. Where possible, RAF Mildenhall will develop and utilize renewable and alternative energy to reduce greenhouse gas emissions. The goals and objectives to increase supply target these three areas: aviation fuel, ground fuels, and infrastructure energy.

3. Energy Awareness and Culture Change

Changing the Air Force culture is critical to achieving the Air Force's and RAF Mildenhall's Energy Vision. As the culture changes and the Air Force increases its energy awareness, new ideas and methodologies for operating more efficiently will emerge as airmen consider energy in their day-to-day duties.

Like the Air Force Energy plan, the Mildenhall plan cuts across functions and is holistic in its approach which capitalizes on **ALL** energy. In Figure 4 we can see that the majority of energy cost stems from our flying operations but there are significant costs associated with Facilities, Vehicles and Ground equipment.

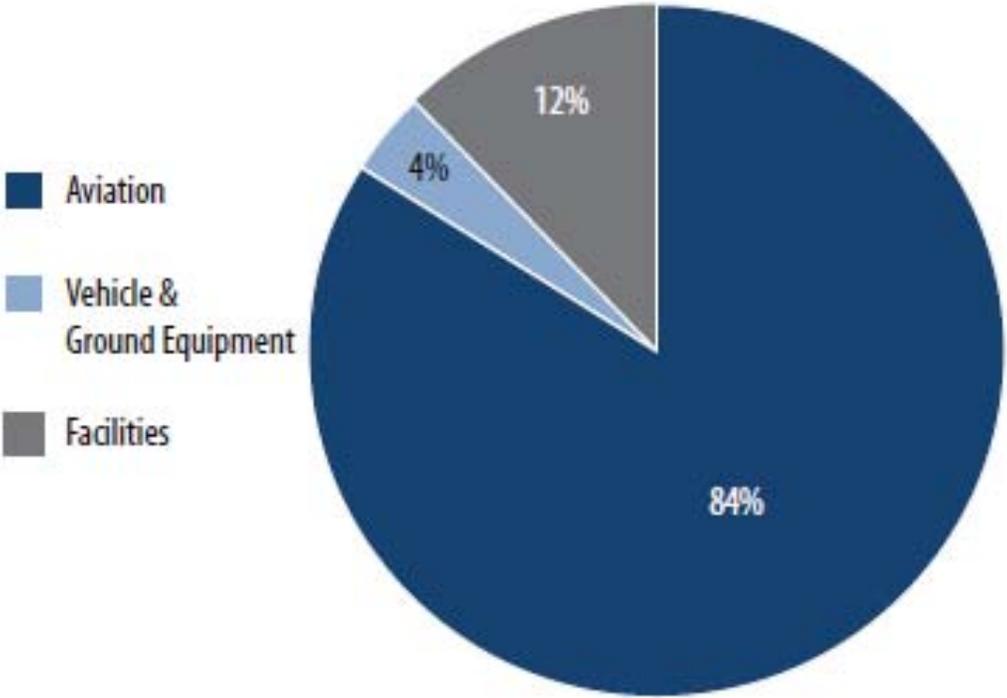


Figure 4 - Breakout of Air Force energy costs per functional

Using the basic Energy plan pillar shown in Figure 3 the Air Force in their Energy Management Plan have expanded this and broken out specific goals, objectives and metrics that align with the Reducing Demand, Increasing Supply and Culture Change as shown in Figure 5 for each of the three primary pillars.

These goals, objectives and metrics within this framework have then been expanded further into functional sub-section frameworks which can be found in Section 1. Infrastructure Energy Plan (OPR: 100 CES), Section 2. Acquisition & Technology Energy Plan (OPR: 100 CES), Section 3. Operations Energy Plan (OPR: 100 OG / 100 LRS) and Section 4 – Energy Awareness and Culture Change (OPR: 100 ARW/PA).



U.S. AIR FORCE

| GOALS | | |
|--|--|--|
| REDUCE DEMAND | INCREASE SUPPLY | CULTURE CHANGE |
| IMPLEMENTING GOALS | | |
| <ul style="list-style-type: none"> Reduce consumption of aviation fuel by 10% by 2015 against a FY2006 baseline Implement pilot fuel efficiency measures in all standardization/evaluation flights by 2010 Incorporate pilot fuel efficiency elements into the UPT training syllabus by 2011 Reduce motor vehicle fleet petroleum fuel use by 2% per annum Reduce installation energy intensity by 3% per annum | <ul style="list-style-type: none"> Increase non-petroleum-based fuel use by 10% per annum in the motor vehicle fleet Increase facility renewable energy at annual targets, 5% by FY2010, 7.5% by FY2013, 25% by FY2025—50% of increase must come from new renewable sources By 2016, be prepared to cost competitively acquire 50% of the Air Force's domestic aviation fuel requirement via an alternative fuel blend in which the alternative component is derived from domestic sources produced in a manner that is greener than fuels produced from conventional petroleum | <ul style="list-style-type: none"> Provide energy leadership through the Energy Management Steering Groups Train all personnel in energy awareness by 2010 Implement an energy curriculum at the Academy and the Air University by 2010 Communicate energy awareness at all installations during Energy Awareness Month each October |
| OBJECTIVES | | |
| <ul style="list-style-type: none"> Increase Conservation Improve Efficiency Enhance Energy Security | <ul style="list-style-type: none"> Increase Alternative Fuels Increase Renewable Energy Utilize Public-Private Partnerships Enhance Energy Security | <ul style="list-style-type: none"> Leadership Training Education Communication |
| IMPLEMENTING OBJECTIVES | | |
| <ul style="list-style-type: none"> Fly efficiently Develop efficient aircraft technology Improve jet engine performance Develop fuel efficient equipment Improve current infrastructure Design new buildings that are 30% better than ASHRAE standards Procure energy efficient products and vehicles Optimize utility procurement Evaluate life cycle costs Refine the Air Force's critical asset list Conduct energy audits Implement Air Force Metering Plan by 2012 and meet annual milestones | <ul style="list-style-type: none"> Develop renewable energy resources on base Procure commercially-produced alternative/renewable energy Test and certify all aircraft and systems against 50/50 alternative fuel blend by 2011 Increase the number of flexible fuel systems Identify/develop privately financed/operated energy production on Air Bases Field the Critical Asset Prioritization Methodology (CAPM) tool Manage costs | <ul style="list-style-type: none"> Provide energy leadership throughout the Air Force Provide energy awareness training to each uniformed and civilian member of the Air Force Develop energy curriculum for Air Force Academy, Air University, and other schools Communicate Air Force energy successes and lessons learned Identify/develop privately financed energy sources on underutilized land |
| METRICS | | |
| <ul style="list-style-type: none"> Barrels of aviation fuel consumed per year Average amount of energy consumed per building sq. ft. Average miles per gallon (MPG) of non-tactical ground vehicles | <ul style="list-style-type: none"> Percent alternative/renewable fuel used for aviation fuel requirements Percent alternative/renewable fuels used for installation energy requirements Percent alternative/renewable fuel used for non-tactical ground vehicle requirements | <ul style="list-style-type: none"> Energy audit score measuring compliance with Air Force energy policies and strategies Percentage of personnel contacted with energy awareness media Percentage of personnel trained in the Air Force energy curriculum Survey score results measuring awareness of Air Force energy policy and strategies |

Figure 5 - Air Force Framework for Energy Management

Section 1 – Infrastructure Energy Plan (IEP) (OPR: 100 CES)

1.1. Strategic Approach

The Air Force’s strategic approach to reduce infrastructure energy is graphically represented in Figure 6. Major goals of the program are supported by four strategic Pillars, each representing a focused area of energy management. Action within each Pillar will be required to produce the broad energy reduction goals mandated by the various federal laws, policies, statutes, etc. (see Appendix G – Statutory and Policy Mandates and Drivers). The Pillars are supported by a base of enabling strategies, or Enablers, intended to posture energy resources and organizations to implement the actions of the Pillars. The three Enablers are set upon a foundation of culture change and asset management.

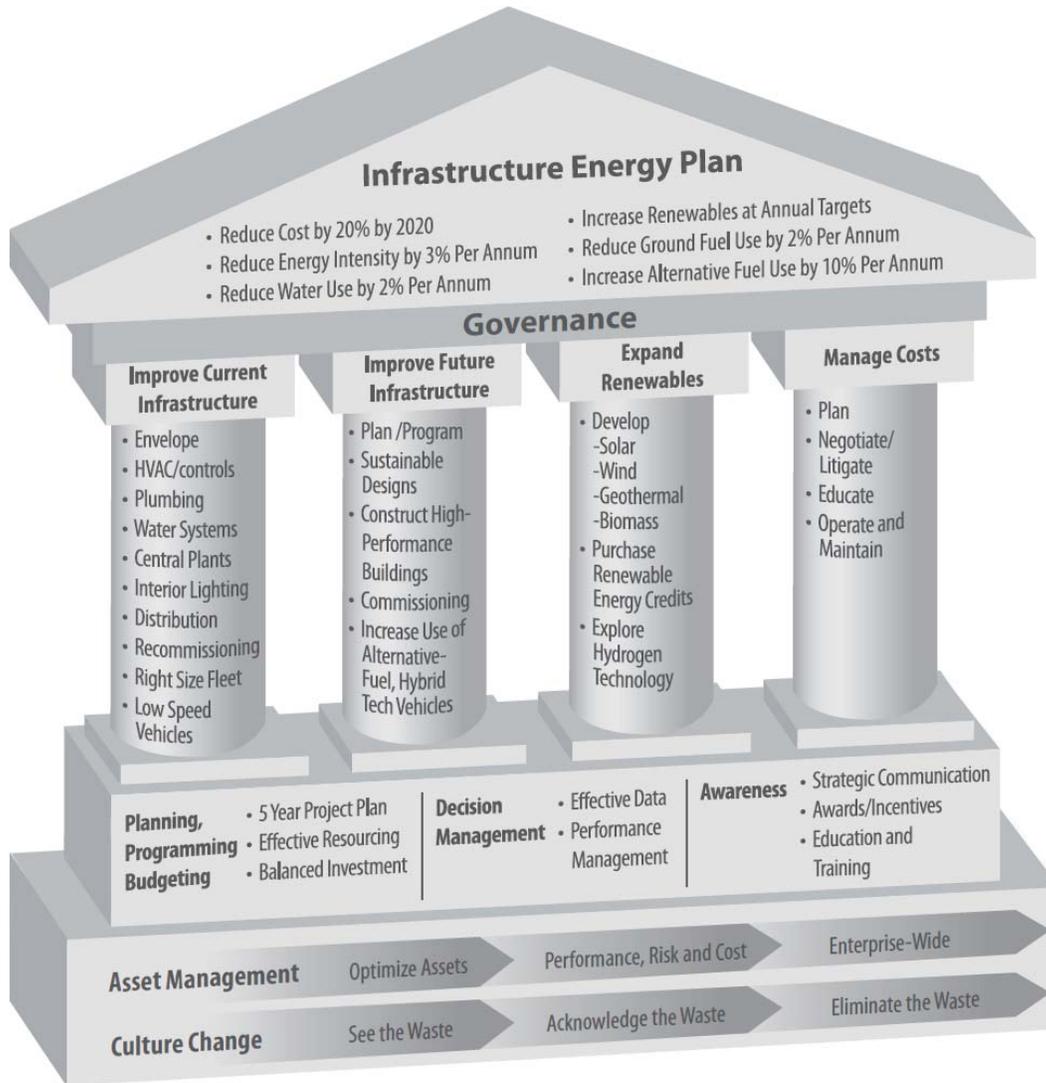


Figure 6 - Infrastructure Energy Strategic Approach

1.2. Culture Change and Asset Management

Participation across Team Mildenhall will be required to reach our goals. There must be a cultural change within the ranks. No longer can “minor” energy waste be ignored. Any degree of waste must be acknowledged and eliminated. Otherwise, the conservation actions of a few will be outweighed by the waste of many. Energy must become a consideration in the actions of every airman, civilian, and contractor.

Culture change begins with awareness. The Enablers of this plan address awareness to leadership through EMSGs and data reporting and to the general base populace through Energy Awareness Month, training and awards/recognition. See Section 4 – Energy Awareness and Culture Change.

The Air Force has undergone an Asset Management transformation. The new approach assesses risk, cost, and benefits to make better informed asset investment decisions. Examining energy, which often dominates the life-cycle cost of a system, is a major part of this transformation. Energy-saving projects require a sound business case and a life-cycle cost analysis to show a positive return on investment.

1.3. Enablers

Existing operations may need to be improved upon to successfully support the four focus pillars of the RAF Mildenhall Energy Management Plan. Defining and driving that improvement are three Enablers. The three Enablers are 1) Decision Management; 2) Plan, Program, and Budget; and 3) Awareness.

The base energy management program will operate within these Enablers thereby generating proper direction and emphasis leading the base to effective action within the Pillars.

The central Enabler is “Decision Management,” because an effective energy management program must begin (and will only succeed) with base leadership accurately understanding their energy status. Data will benefit the program if it is useful and used. The recent push to install advanced meters will support Base Energy Managers (BEMs) in assessing their installation performance and short and long term needs. As short and long term needs are understood, a second Enabler, proper “planning, programming, and budgeting”, will create sustainable investment this year and for years to come. BEMs will continually work within the third Enabler, “Awareness”, so energy becomes a consideration in all we do.

1.3.1. Decision Management

Decision Management is the central Enabler in the RAF Mildenhall Infrastructure Energy Management Plan. It is a set of activities that converts raw data into actionable information on the efficiency and performance of energy systems.

RAF Mildenhall will:

- 1.3.1.1. Confirm the energy (FY 2003) and water (FY 2007) baselines, including the justification of any atypical usage patterns and/or estimates.
- 1.3.1.2. Maintain graphical representation of resource consumption and report to quarterly EMSG. Graphs are maintained in Appendix B - Base Performance Charts.
- 1.3.1.3. Eliminate barriers to the timely and accurate reporting of quarterly data. Efforts may include installation of additional meters, more frequent meter reading, contract negotiations with resource suppliers, etc.

1.3.2. Plan, Program, and Budget

Planning, Programming, and Budgeting (PPB) is the process used to identify requirements and resources necessary to meet or exceed our energy mandates and optimize available sources of funds.

RAF Mildenhall will:

- 1.3.2.1. Develop, publish, and annually update a base energy management plan.
- 1.3.2.2. Publish a list of the highest energy and water consuming buildings/systems on base (known or assumed). The list is reviewed and reduction strategies (including audits) are discussed at the Energy Utility Management Working Group and Energy Management Steering Group meetings. This list is maintained in Appendix D1 – Highest Energy Users on Base & Appendix D2 – Highest Water Users on Base.
- 1.3.2.3. Develop a 24-month project development plan. The plan is a list of energy projects under development or to be evaluated or executed in the next 24 months. The plan is presented quarterly to the EMSG and maintained in Appendix C – 24 Month Project Development Plan.
- 1.3.2.4. Develop a Utility Metering Strategy which is cost effective to implement and identify installation progress to EMSG. Program projects to install all cost effective metering as necessary.
- 1.3.2.5. Assess current Energy Management Control System (EMCS) / Building Management Systems (BMS) settings for energy saving opportunities and implement improvements.

1.3.3. Awareness

Energy awareness is about the human element and behavioral change. It bridges the gap between the actions and technology that conserve energy and the people who apply them or must accept and use them to create the actual energy savings.

RAF Mildenhall will:

- 1.3.3.1. Develop an Energy Awareness Campaign Plan that includes energy awareness activities, including Energy Awareness Month. Activities are reported to the EMSG each quarter.
- 1.3.3.2. Advertise and advocate for the quarterly installation energy award. (Align with USAFE recognition program, once established)

1.4. Pillars

Meeting or exceeding our energy reduction goals will be accomplished as we exercise the “levers” of the infrastructure energy management plan. These levers are represented as the Pillars of Figure 6 and define focused action areas of energy management. The Pillars are 1) Improve Current Infrastructure, 2) Improve Future Infrastructure, 3) Expand Renewables, and 4) Manage Costs.

The pillars are categories of focused action. For example, a base may install daylight and occupancy sensing lighting controls, thus “Improving the Current Infrastructure.” The “Improve Future Infrastructure” Pillar is sustained as the base energy manager participates in project design reviews to ensure lighting guidance/policy is applied in new or renovation construction projects, for example. To “Manage Costs”, the base energy manager will act as the local technical expert advising contracting personnel and training building managers and occupants in lighting efficiency technologies.

The “Expand Renewables” pillar will be largely supported at the MAJCOM and Air Force levels.

1.4.1. IEP Pillar 1 – Improve Current Infrastructure

This pillar focuses on increasing energy efficiency in our current facilities and equipment as well as actively conserving water through a variety of specific actions.

RAF Mildenhall will:

- 1.4.1.1. Hold an Energy Utility Management Working Group (EUMWG) meeting quarterly to give energy guidance, discuss energy project suggestions, and develop EMSG actions. Membership is listed in Appendix A.
- 1.4.1.2. Participate in the Work Request Review Board.
- 1.4.1.3. Interject energy efficiency considerations into the base RWPs during an annual review with facility maintenance leadership.
- 1.4.1.4. Establish Environmental Management System (EMS) to implement energy management targets and objectives.

1.4.2. IEP Pillar 2 – Improve Future Infrastructure

This pillar focuses on improving processes and applying sustainable energy efficiency standards to accelerate the delivery of high-performance buildings and supporting infrastructure into the Air Force inventory.

RAF Mildenhall will:

- 1.4.2.1. Perform an energy evaluation of each MILCON project at the 35% or earlier design level.
- 1.4.2.2. Ensure that 100 percent of new construction is capable of achieving LEED Silver certification.
- 1.4.2.3. Ensure base standards incorporate the use of high performance materials and effective energy / water efficient systems.
- 1.4.2.4. Ensure all construction projects comply with established base standards and other regulatory requirements
- 1.4.2.5. Promote sustainability and energy savings via the RAF Mildenhall General Plan.
- 1.4.2.6. Provide collaborate input into the Recurring Work Program (RWP) to ensure performed maintenance activities prevent inefficient system operations.

1.4.3. IEP Pillar 3 – Expand Renewable Energy

This pillar promotes the development and attainment of renewable and alternative energy for use in our facilities. RAF Mildenhall will identify potential renewable energy / water efforts to HQ USAFE. Currently none have been identified; however, we are researching the following potential technologies:

- 1.4.3.1. Solar
- 1.4.3.2. Wind
- 1.4.3.3. Geothermal
- 1.4.3.4. Biomass
- 1.4.3.5. Water reused
- 1.4.3.6. Heat recovery via Biodigestion

1.4.4. IEP Pillar 4 – Manage Costs

This pillar focuses on methods to significantly reduce or stabilize utility cost through favorable terms, service, and rates. Purchased utilities include electricity, natural gas, fuel oil, liquid propane, coal, steam, and hot water. Water and sanitary sewer are two additional non-energy utility categories that are managed under this pillar.

RAF Mildenhall will:

- 1.4.4.1. Identify all late fees paid since the beginning of FY 2010. Determine root causes of all late fees identified and address with corrective action.
- 1.4.4.2. Identify all current utility surcharges and assess strategies for eliminating these.

1.5. Conclusion

Implementing this section of the energy management plan will provide RAF Mildenhall senior leaders with oversight on our progress of infrastructural energy / water conservation measures. Additionally it will provide the necessary framework to develop holistic cross functional energy management.

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Section 2. Acquisition & Technology Energy Plan (OPR: 100 CES)

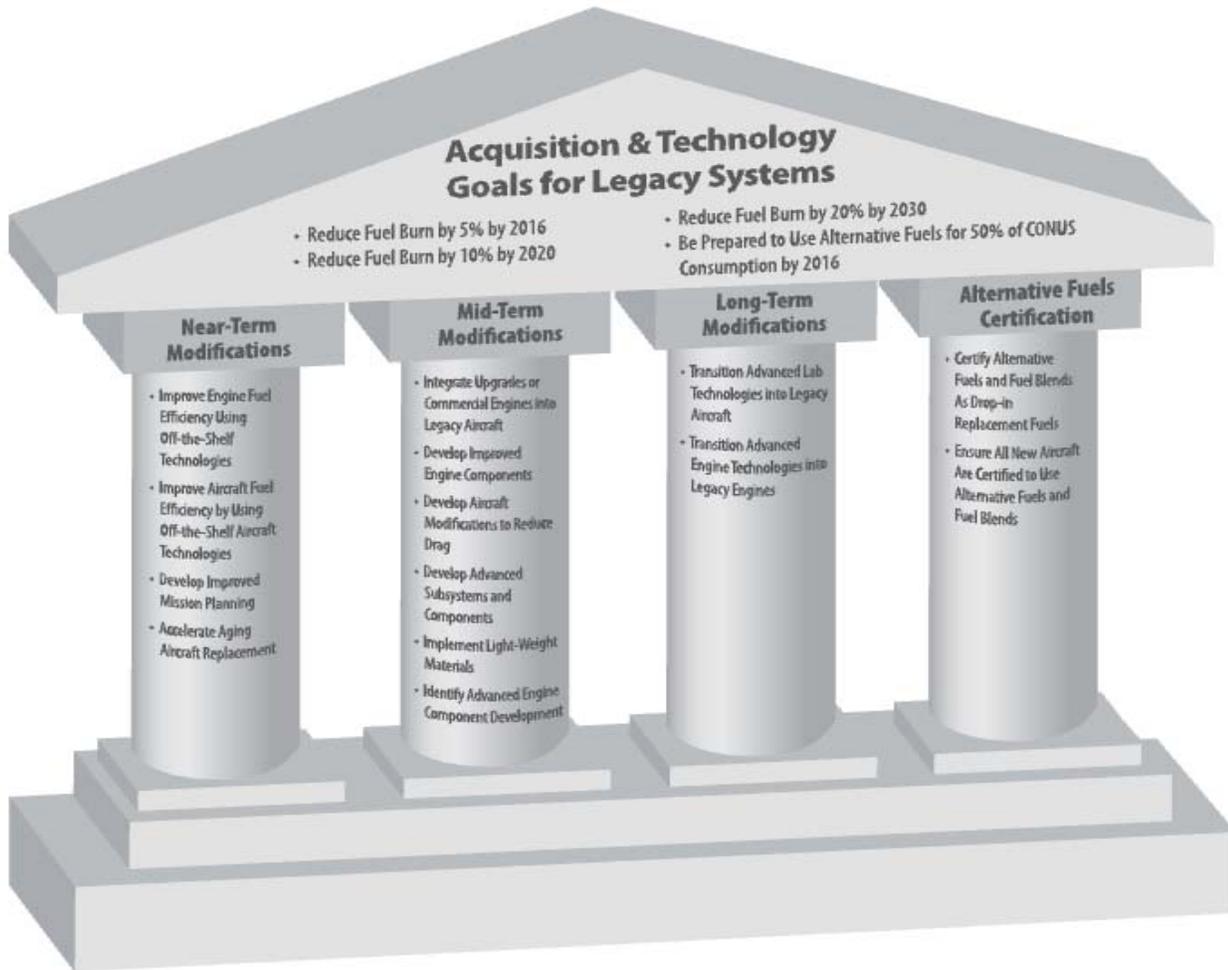


Figure 7 - Acquisition and Technology Strategic Approach

2.1. Strategic Approach

The Air Force's strategic approach to reduce energy through Acquisition and Technology is graphically represented in Figure 7. Acquisition and Technology energy management is currently not relevant to present mission.

2.2. Conclusion

Should our mission alter and make this section of the EMP relevant, this section will be revised as applicable.

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Section 3. Operations Energy Plan (OPR: 100 OG / 100 LRS)

Section 3A – Aviation Operations (100 OG)

3A.1. Strategic Approach

As indicated in Air Force Basic Doctrine, Air Refueling serves as both a force enabler and force multiplier, directly supporting multiple Air and Space Power tenets, including flexibility and persistence. As such, it has been the backbone of nearly every major combat engagement since its inception. Within the United States Air Forces in Europe, the 100th Air Refueling Wing provides the only permanently stationed US Air Force air refueling capability covering a 20 million square mile AOR while serving the needs of 2 Geographic Combatant Commands and the North Atlantic Treaty Organization. As theater air refueling experts, meeting customer mission needs, providing flexibility and persistence, and therefore ensuring mission effectiveness, is at the heart of what we do. However, fuel is an expensive commodity and efficiency cannot be routinely sacrificed in order meet mission demands. Rather, it is an inherent tanker and receiver responsibility to balance mission effectiveness with efficiency, ensuring resource conservation. This balance is key to the 100 ARW Aviation Operations Energy Plan.

The Air Force’s strategic approach to reduce aviation operations energy is graphically represented in Figure 8. Major goals of the program are supported by four strategic pillars, each representing a focused area of energy management. Action within each pillar will be required to produce the broad energy reduction goals mandated by the various federal laws, policies, statutes, etc. The pillars are supported by a base of enabling strategies, or enablers, intended to posture energy resources and organizations to implement the actions of the pillars.

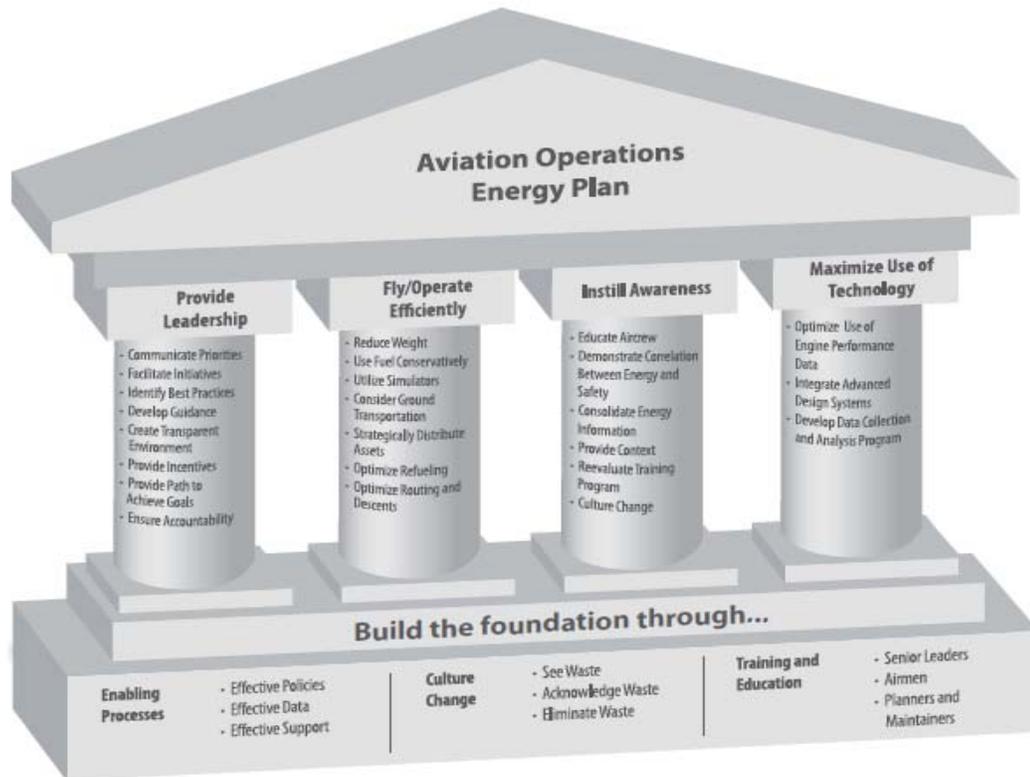


Figure 8 - Aviation Operations Energy Plan

3A.2. Enablers

Existing operations may need to be improved upon to successfully support the four focus pillars of the 100 ARW Aviation Operations Energy Plan. Defining and driving that improvement are three enablers. They are 1) Enabling Processes; 2) Culture Change; and 3) Training and Education.

3A.2.1. Enabling Processes

In order to achieve meaning, tangible, lasting energy savings, conservation actions must be process based, rather than “one off” events. The focus must be on process based methodologies that are repeatable and are built into recurring tasks and standard operating procedures.

3A.2.2. Energy Awareness and Culture Change

Today’s economic and environmental pressures demand a shift in thinking. While in previous generations mission effectiveness was frequently the singular focus, such an approach is no longer possible or appropriate. Consequently, a concerted effort to change the mindset of wing Airmen is required.

3A.2.3. Training and Education

In order to enact culture change, Airmen must understand the reasoning and focus of energy management measures. This must occur from the top down, officer, SNCO, NCO, and Airmen alike. Otherwise, the other foundations of the Aviation Operations Energy Management Plan, enabling processes and culture change, will fail.

3A.3. Air Operations Energy Plan Pillars

Meeting or exceeding our energy reduction goals will be accomplished as we exercise the “levers” of the Aviation Energy Management Plan. These levers are represented as pillars and define focused action areas of energy management. They are based on the Air Force Operations Energy Plan indicated in Figure 8. Within each pillar there are individual objectives and metrics. However, not all AF pillars, objectives, and metrics are applicable to every individual wing plan. Accordingly, the following represent key Aviation Operations areas where the 100 ARW will focus energy management, specifically fuel conservation, measures:

3A.3.1. AOEP Pillar 1 – Provide Leadership in Energy Management

RAF Mildenhall will:

- 3A.3.1.1. Ensure leadership’s energy priorities are communicated throughout the 100 ARW
- 3A.3.1.2. Identify/facilitate energy efficiency initiatives
- 3A.3.1.3 Identify “Best Practices” and propagate throughout USAFE, AMC, and across the Air Force
- 3A.3.1.4. Develop performance-oriented guidance to drive excellence in energy management
- 3A.3.1.5. Create transparent environment under which 100 ARW aviation operations energy reduction procedures are conveyed throughout USAFE, AMC, and across the Air Force
- 3A.3.1.6. Provide proposed path forward for achieving energy objectives
- 3A.3.1.7. Ensure leadership is accountable for executing energy management strategies

RAF Mildenhall Metrics

- 3A.3.1.8. Incorporate Aviation Operations Energy Management Plan measures into the 100 OG and 100 ARW Strategy Alignment and Deployment Monthly Metrics

3A.3.2. AOEP Pillar 2 – Fly and Operate Efficiently

RAF Mildenhall will:

- 3A.3.2.1. Optimize aircraft configurations for each mission
- 3A.3.2.2. Optimize fuel loads for each mission
- 3A.3.2.3. Optimize air refueling scheduling, internally and with receiver units (track time, track location)
- 3A.3.2.4. Optimize routing and profile descents
- 3A.3.2.5. Use simulator capability to the maximum extent possible when fidelity permits training sortie substitution

RAF Mildenhall Metrics

- 3A.3.2.6. Evaluate internal guidance btw operations and maintenance scheduling staffs on proper aircraft configuration for various mission requirements
- 3A.3.2.7. Evaluate guidance to minimize engine running ground time
- 3A.3.2.8. Track various mission metrics to include
 - 3A.3.2.8.1. Planned vs actual ramp fuel load
 - 3A.3.2.8.2. Planned vs actual off load
 - 3A.3.2.8.3. Planned vs actual receiver track time
 - 3A.3.2.8.4. Planned vs actual receiver number
 - 3A.3.2.8.5. Auxiliary Power Unit vs Ground Power Cart usage
 - 3A.3.2.8.6 Fuel dump rates
- 3A.3.2.9. Track simulator usage rates

3A.3.3. AOEP Pillar 3 – Install Energy Awareness Across Aviation Operations

RAF Mildenhall will:

- 3A.3.3.1. Educate and evaluate fuel conservation during aviation operations
- 3A.3.3.2. Develop, maintain, and advertise the 100 ARW Air Operations Energy Management Plan
- 3A.3.3.3. Provide the context as to why aviation operations are important to energy issues
- 3A.3.3.4. Evaluate training programs to ensure they are reflective of energy goals and operational situational considerations
- 3A.3.3.5. Instill a culture where every Airman works to fly more efficiently

RAF Mildenhall Metrics

- 3A.3.3.6. Track socialization of Aviation Operations Management Plan initiatives through Special Interest Item briefing requirements, training day presentations, and commander's calls

3A.3.4. AOEP Pillar 4 – Technology Maximization

- 3A.3.4.1 Not utilized at the wing level

3A.4. Initiatives

To support the Aviation Operations Energy Management Plan Pillars/Objectives, the 100 ARW has undertaken a number of initiatives. They are:

3A.4.1. Air Refueling Liaison Officer (ARLO):

Research has identified a number of inefficiencies in receiver air refueling scheduling. These include excessive track time, receivers taking less fuel than scheduled, and fewer receivers showing than scheduled. The ARLO is designed to liaise with receiver units to assist with air refueling scheduling. He is tasked to help eliminate overages through more effective communications with receiver units, facilitate discussions with receiver units as to actual needs, not just what is scheduled, and serve as a data collection point to track overages and efficiencies to highlight potential problem areas. The program started in Feb 2011 with the 48 FW.

3A.4.2. “Just-in-time” Refueling (JITR):

The civilian airline industry finalizes aircraft fuel loads as close to take-off time as possible to account for weather and other flight issues. However, due to maintenance personnel constraints, the 100 ARW fuels its tankers as early as 1500L the day prior to mission execution. Due to changes in receiver requirements or actual number of receiver aircraft able to fly on the mission day, the fuel loads are frequently too heavy for the tasked mission, thus requiring the aircraft to either “fly heavy” or download fuel, a very time consuming and manpower intensive task. The JITR process will fuel sorties that display a high risk of late fuel load changes much closer to takeoff time, after consultation with aircrew or mission planners, to ensure the most accurate fuel load. The JITR program was the result of an Ops-Mx AFSO21 event held in Jan 2011.

3A.4.3. Elimination of “rounding” requirements:

KC-135 mission planners have always rounded fuel loads to the nearest 5000 lb. increment. This was based on an interpretation of maintenance Technical Orders. In Jan 2011, the 100 ARW began planning missions to the nearest 1000 lbs. This allows for more precise fuel loads and eliminates one of the potential causes of “flying heavy”. This process change has been shared with the HQ AMC Fuel Efficiency and Stan/Eval offices. Incorporation into the KC-135, and potentially MAF fleet, is likely.

3A.5. Conclusion

Energy management is a direct function of how our maintenance and support personnel prepare aircraft and missions to how our aircrews operate the aircraft in flight. Within the 100 ARW, fuel is our business and conservation efforts are part of that business. The 100 ARW Aviation Operations Management Plan is enabled through long lasting energy management processes, shifting existing cultures to focus on energy management, and training and education our Airmen. At the heart of the plan are three central pillars: Leadership Involvement/Support, Fly and Operate Efficiently, Install Energy Awareness Across Aviation Operations.

Section 3B – Ground Operations Energy Plan (GOEP) (100 LRS / 100 MXS)

3B.1. Strategic Approach

The RAF Mildenhall's strategic approach to reduce ground operations energy is graphically represented in Figure 6. Major goals of the program are supported by four strategic Pillars similar to that in the Infrastructure Energy Plan (IEP). See Section 1 – Infrastructure Energy Plan (IEP) (OPR: 100 CES), 1.1.

3B.2 Culture Change and Asset Management

Cooperation by all Team Mildenhall units and ranks will be required to reach our goals. Cultural change across the board will be our biggest challenge as we need to emphasize the campus mentality and maneuver people away from driving everywhere as fuel costs spiral and climate change issues expand. Whilst we have no direct control over the procurement of government vehicles we need to lobby for more economical and environmentally friendly vehicles if we're to meet the challenges ahead.

3B.3. Enablers

Existing operations may need to be improved upon to successfully support the four focus pillars of the RAF Mildenhall Energy Management Plan. Defining and driving that improvement are three Enablers. The three Enablers are 1) Decision Management; 2) Plan, Program, and Budget; and 3) Awareness.

3B.3.1. Decision Management

Decision Management is the central Enabler in the RAF Mildenhall Ground Operations Energy Plan. It is a set of activities that converts raw data into actionable information on the efficiency and performance of energy systems.

RAF Mildenhall will:

- 3B.3.1.1. Determined primary Key performance Indicators. Review current ground fuel consumption vs. miles driven, including the justification of any atypical usage patterns and/or estimates.
- 3B.3.1.2. Maintain graphical representation of resource consumption and report to quarterly EMSG.
- 3B.3.1.3. Eliminate barriers to the timely and accurate reporting of quarterly data.

3B.3.2. Plan, Program, and Budget

Planning, Programming, and Budgeting (PPB) is the process for identifying requirements and resources required to meet or exceed our energy mandates and optimize available sources of funds.

RAF Mildenhall will:

- 3B.3.2.1. Develop, publish, and annually review a base energy management plan.
- 3B.3.2.2. Identify vehicles suitable for right sizing with a view to fuel economy along with those vehicles that could be eliminated from the Vehicle Authorization Listing (VAL) prior to the next Vehicle Validation Visit (VWV).

3B.3.3. Awareness

Energy awareness is about the human element and behavioral change. It bridges the gap between the actions and technology that conserve energy and the people who apply them or must accept and use them to create the actual energy savings.

RAF Mildenhall will:

- 3B.3.3.1. In accordance with Section 4 – Energy Awareness and Culture Change (OPR 100 ARW/PA), assist 100 ARW/PA to develop an Energy Awareness Campaign Plan that includes energy awareness activities, including Energy Awareness Month. Activities are reported to the EMSG each quarter.
- 3B.3.3.2. Advertise and advocate for the quarterly installation energy award. (Align with USAFE recognition program, once established)

3B.4. Pillars

Meeting or exceeding our energy reduction goals will be accomplished as we exercise the “levers” of the infrastructure energy management plan. These levers are represented as the Pillars of Figure 6 and define focused action areas of energy management. The Pillars are 1) Improve Current Infrastructure, 2) Improve Future Infrastructure, 3) Expand Renewable, and 4) Manage Costs.

3B.4.1. GOEP Pillar 1 – Improve Current Ground Operations

We have limited impact on this area as we have to work with the assets we have.

RAF Mildenhall will:

- 3B.4.1.1. Review existing processes with a view to consolidating workloads. (See Appendix B - Base Performance Charts - Table 56, Aircrew meal collection and Table 7, Serviceable Turn-Ins)
- 3B.4.1.2. Review operations and reduce waste/costs (See Appendix B - Base Performance Charts - Table 5, Lakenheath Shuttle Bus Run)
- 3B.4.1.2. Review and request an increase in the number of usable low speed vehicles through the VVV.
- 3B.4.1.3. Explore Smart positioning of Aerospace Ground Equipment (AGE) systems.
- 3B.4.1.4. Reduce ground fuel use. (See Appendix B – Base Performance Charts – Table 4).

3B.4.2. GOEP Pillar 2 – Improve Future Ground Operations

This pillar focuses on improving processes and applying sustainable energy efficiency standards to accelerate the delivery of sustainable equipment and process for ground operations at RAF Mildenhall.

RAF Mildenhall will:

- 3B.4.2.1. Plan / Program energy efficient vehicles

3B.4.2.2. Increase use of alternative fuel, hybrid tech vehicles

3B.4.2.3. Explore energy efficient AGE systems.

3B.4.3. GOEP Pillar 3 – Expand Renewable Energy

This pillar promotes the development and attainment of renewable and alternative energy for use in our vehicle and AGE fleet.

RAF Mildenhall will

3B.4.3.1. Identify potential life cycle cost effective alternative fueled vehicles.

3B.4.3.2. Plan / Program and implement alternatives in Para 3B.4.3.1.

3B.4.4. GOEP Pillar 4 – Manage Costs

This pillar focuses on methods to significantly reduce or stabilize vehicle running costs through favorable terms, service, and rates.

RAF Mildenhall will:

3B.4.4.1. Rationalize vehicle usage and reduce where practical

3B.4.4.2. Educate operators on more efficient driving styles which will improve fuel economy, reduce maintenance cost, and extend the vehicle lifecycle

3B.5. Conclusion

Implementing this section of the energy management plan will provide RAF Mildenhall senior leaders with oversight on our progress of ground vehicle energy conservation measures. Additionally it will provide the necessary framework to develop holistic cross functional energy management.

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Section 4 - Energy Awareness and Culture Change (OPR 100 ARW/PA)

4.1. Strategic Approach

As identified in previous sections of this plan, culture is a key element to the RAF Mildenhall Energy management Plan. See Figure 3 - Air Force Energy Plan Pillars.

4.2. Purpose:

To reinvigorate energy consciousness throughout Team Mildenhall in a sustaining fashion. This plan will enable Public Affairs to continue to use October, Energy Awareness Month, as the primary distribution time of energy-related products, however not limit focus on this subject to only one part of the year.

4.3. Target Audiences:

All Team Mildenhall Airmen, DOD and MOD civilians, contracted workers, and their families.

4.4. Assumptions:

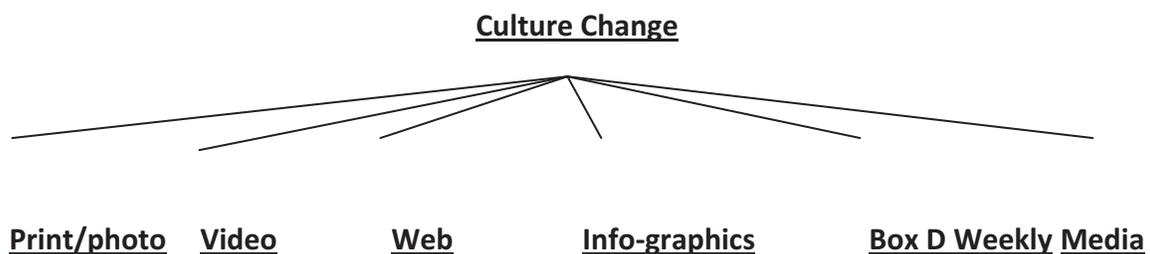
- 4.4.1. Many members may believe that their small office measures won't make a dent in the Air Force's energy usage amounts.
- 4.4.2. People will be more willing to conserve energy if they can see "what's in it for me."
- 4.4.3. Outside agencies have a major contribution to RAF Mildenhall's conservation. Informing all Team Mildenhall pilots about sortie fuel conservation won't make as much of an impact without educating receiver aircraft from other installations.
- 4.4.4. Website can provide one-stop shop for publicizing awareness effort.

4.5. Goals and Objectives:

To communicate effectively and factually RAF Mildenhall command messages, while:

- 4.5.1. Informing Airmen, civilians, families about key programs.
- 4.5.2. Show everyday people what's in it for them.
- 4.5.3. Publicise any possible recognition/reward programs.
- 4.5.4. Providing avenues for energy conservation suggestions.

4.6. Tactics



4.7. Dynamics of program

The Internal Information Division, Community Relations Division and Media Relations Division will streamline efforts to expand public awareness and bolster the public website focusing on a main pillar of the Air Force Energy Plan: Culture Change. This will be accomplished by recurring themes and highlighting success stories in the other two main pillars: Reduce Demand and Increase Supply.

4.7.1. Internal Information Division will:

- 4.7.1.1. Provide print coverage of base activities on a quarterly basis. These news topics will be provided by EUMWG members in a scheduled fashion. Public Affairs will not be responsible for seeking out projects or programs to highlight. Articles will highlight success stories and attempt to demonstrate to Team Mildenhall "what's in it for them."
- 4.7.1.2. Produce stand-alone imagery when print coverage is not warranted or not the proper medium. This will also be a tool used for quick turnaround highlights.
- 4.7.1.3. Develop energy management Web page on base website, www.mildenhall.af.mil.
- 4.7.1.4. Coordinate video projects or "info-mercials" on the subject matter. These videos will be loaded on the public website and forwarded to Defense Media Activity for higher headquarters usage.
- 4.7.1.5. Coordinate photo efforts for support of print stories and info-graphics.
- 4.7.1.6. Coordinate info-graphics to be displayed at key locations for maximum exposure of programs.
- 4.7.1.7. Send reminder bulletins, advertisements incorporated into Box D Weekly e-newsletter.
- 4.7.1.8. Run Powerpoint slides provided by other agencies on the Commander's Access Channel.
- 4.7.1.9. Forwarded all products to USAFE/PA and DMA to highlight base's dedication to program.

4.7.2. Community Relations Division will:

- 4.7.2.1. Highlight base energy-management measures on base tours, community orientation flights and speaking engagements.

4.7.3. Media Relations Division will:

- 4.7.3.1. Exploit media contacts to maximize exposure.

4.8. Focus Group:

Develop a focus group from members of the Energy Utility Management Working group.

Appendices

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Appendix A – Key Energy Management Personnel

Table 2 - Energy Utilities Management Working Group (EUMWG) Members

| Name | Title / Position |
|-------------|------------------|
| 100 MSG/CD | Chair |
| 100 OG/CD | Voting Member |
| 100 MXG/CD | Voting Member |
| 100 CES/CC | Voting Member |
| 100 SFS/CD | Voting Member |
| 100 ARW/PA | Voting Member |
| 352 SOG/CD | Voting Member |
| 727 AMS/CD | Voting Member |
| 95 RS/CC | Voting Member |
| 488 IS/CC | Voting Member |
| 100 LRS/CD | Voting Member |
| 100 FSS/CC | Voting Member |
| AFFES | Voting Member |
| RAF CC | Voting Member |
| 100 ARW/SE | Voting Member |
| 100 CS/CC | Voting Member |
| 100 ARW/ATO | Member |
| 100 CES/CEA | Member |
| 100 CES/CEF | Member |
| 100 CES/CEP | Member |
| 100 CES/CEO | Member |
| | |

Table 3 - Energy Management Steering Group (EMSG) Members

| Name | Title / Position |
|-------------|------------------|
| 100 ARW/CV | Chair |
| 100 MSG/CC | Voting Member |
| 100 OG/CC | Voting Member |
| 100 MXG/CC | Voting Member |
| 100 CES/CC | Voting Member |
| 100 SFS/CC | Voting Member |
| 100 ARW/PA | Voting Member |
| 352 SOG/CC | Voting Member |
| 727 AMS/CC | Voting Member |
| 95 RS/CC | Voting Member |
| 488 IS/CC | Voting Member |
| 100 LRS/CC | Voting Member |
| 100 FSS/CC | Voting Member |
| AFFES | Voting Member |
| RAF CC | Voting Member |
| 100 ARW/SE | Voting Member |
| 100 CS/CC | Voting Member |
| 100 ARW/ATO | Member |
| 100 CES/CEA | Member |
| 100 CES/CEF | Member |
| 100 CES/CEP | Member |
| 100 CES/CEO | Member |
| | |
| | |

Appendix B - Base Performance Charts

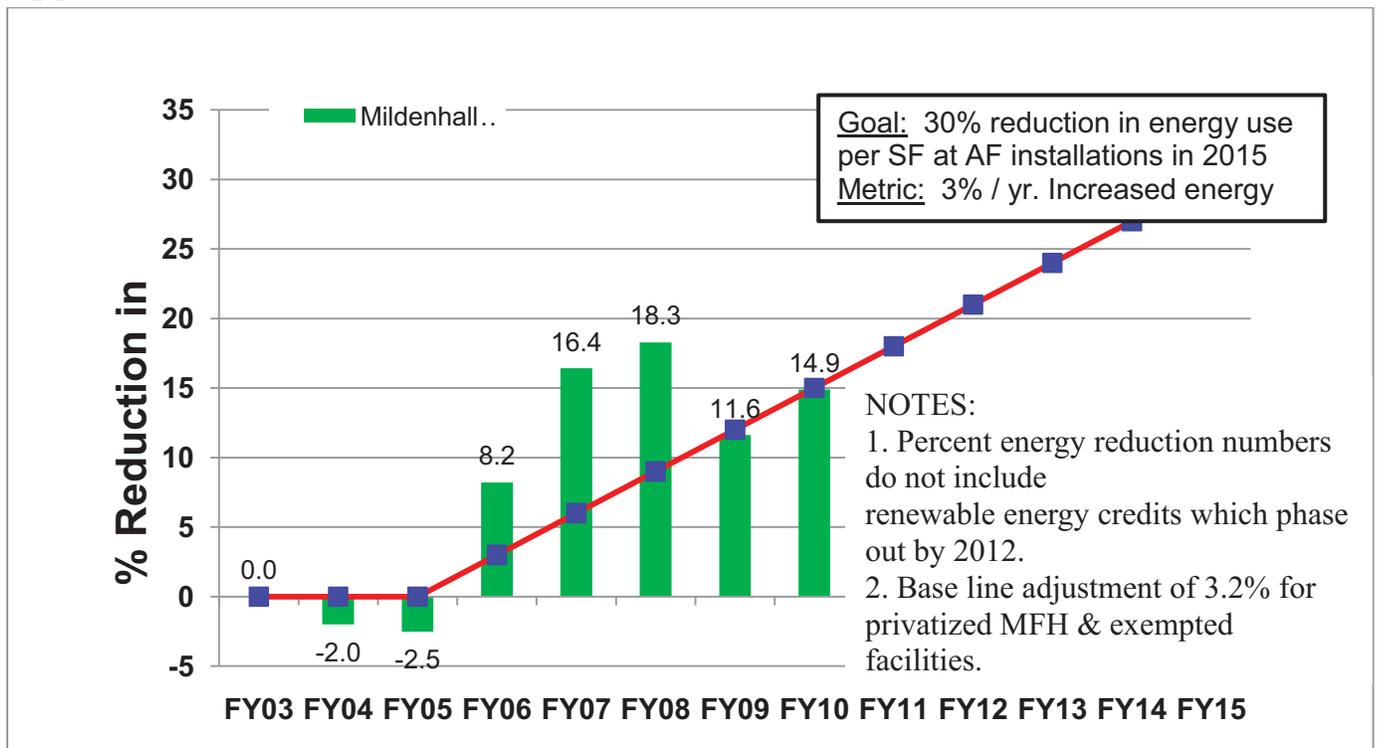


Figure 9 - Base energy reduction tracking since FY03 (updated 07 FEB 2011)

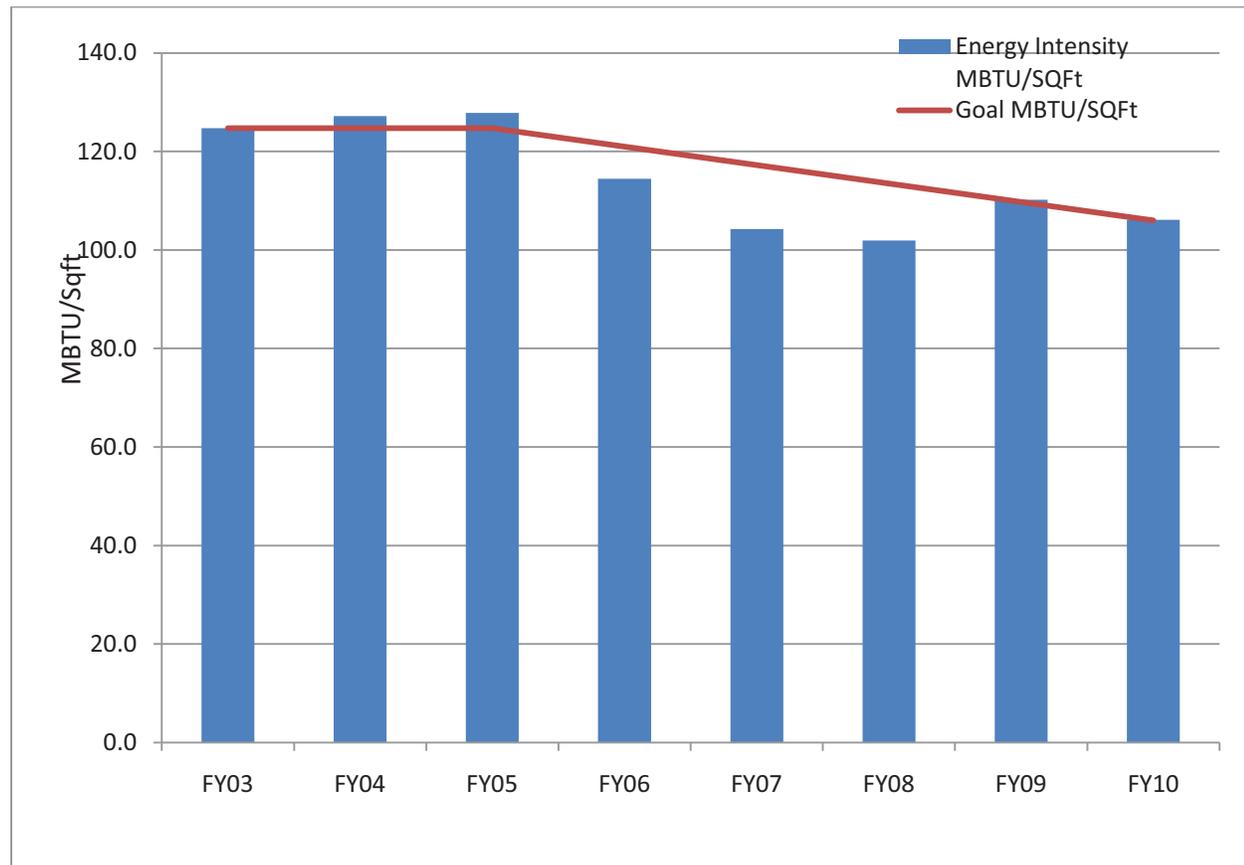


Figure 10 - Base energy intensity since FY03 (updated 07 FEB 2011)

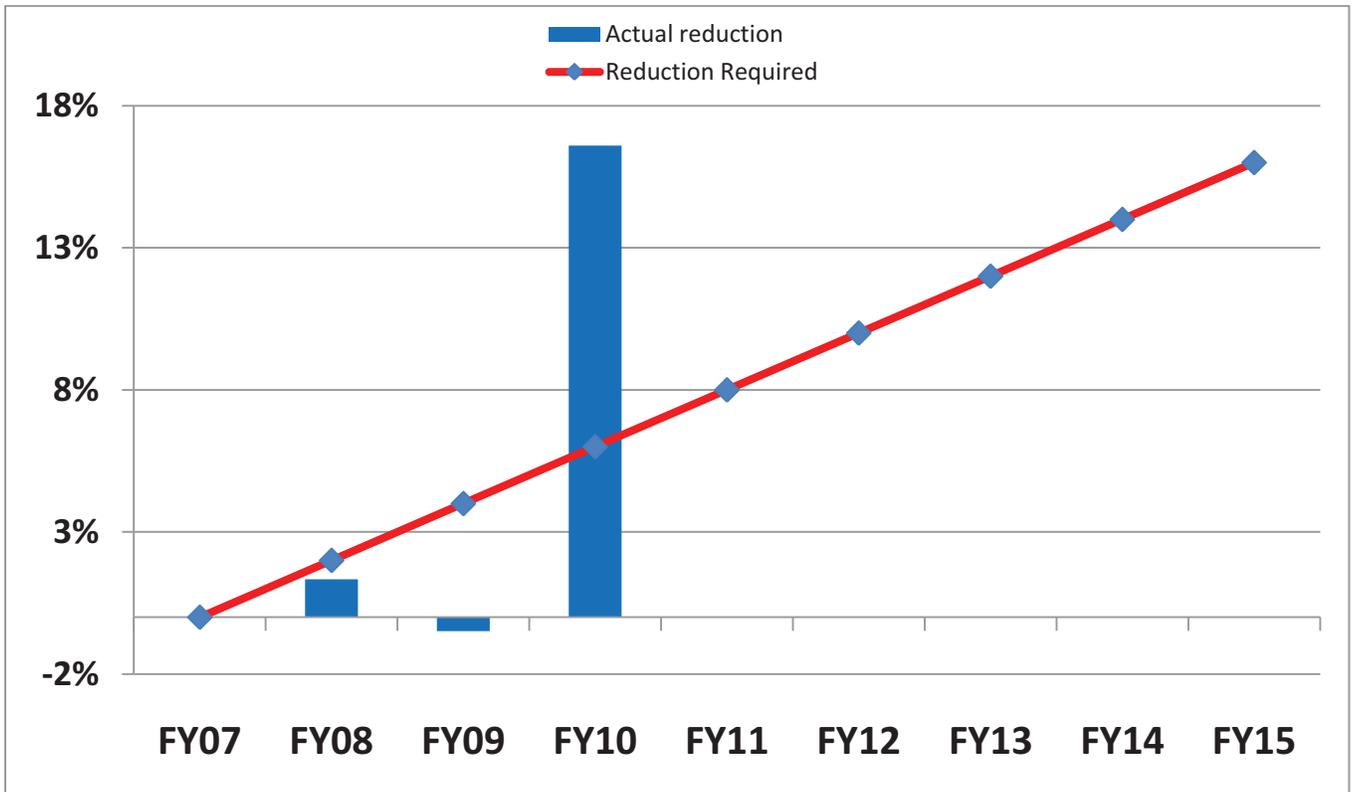


Figure 11 - Base water reduction tracking since FY07 (updated 07 FEB 2011)

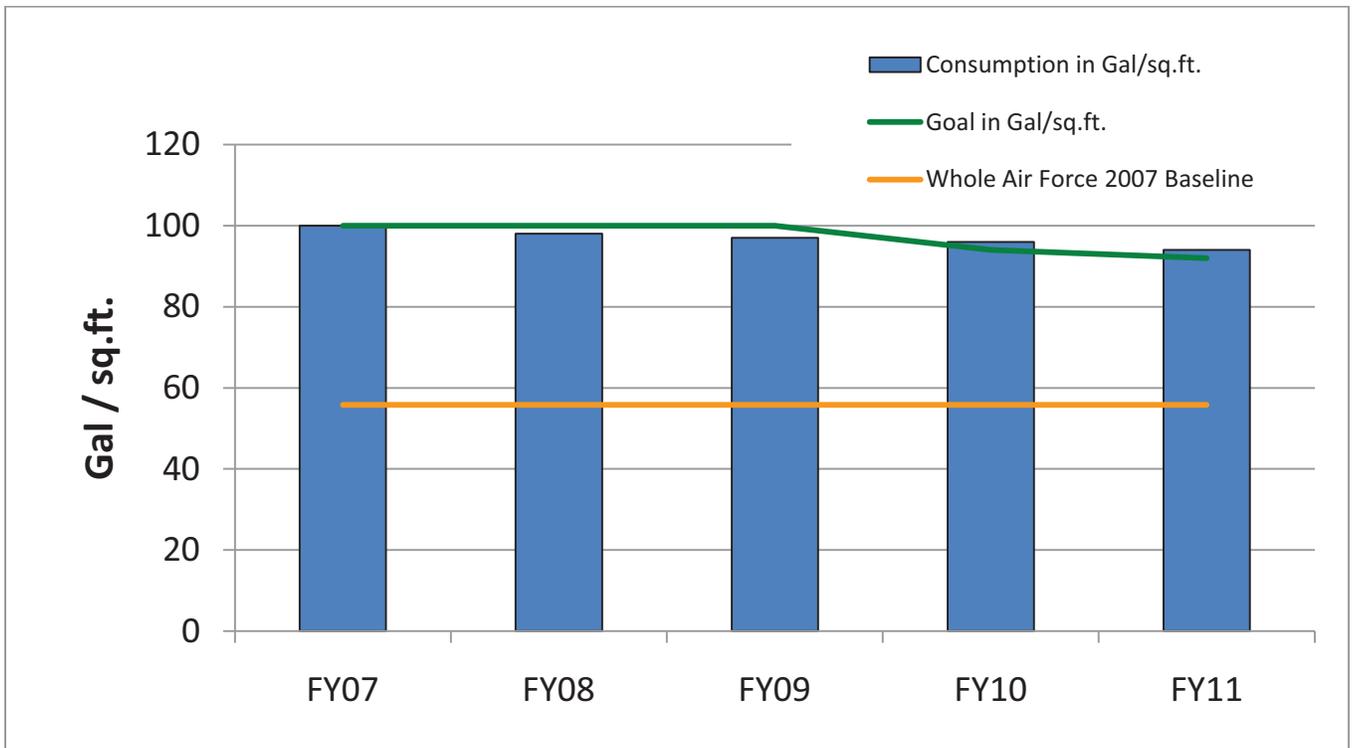


Figure 12 - Base water intensity since FY07 (updated 07 FEB 2011)

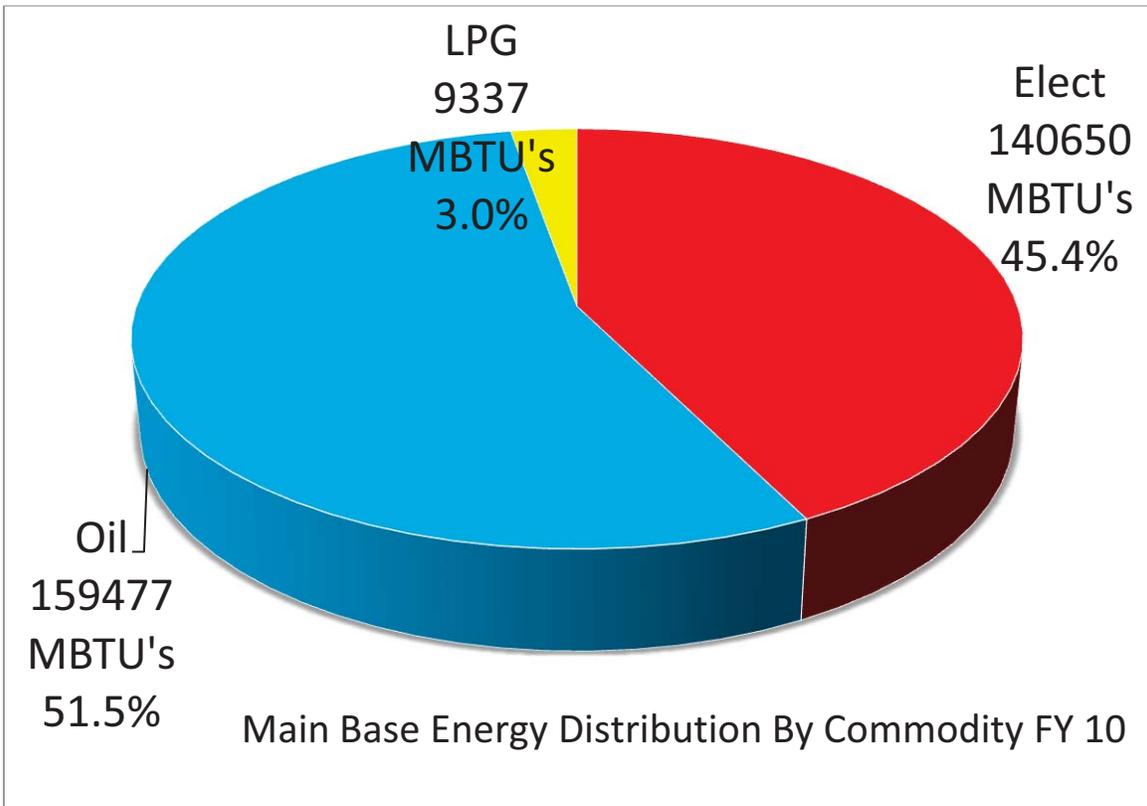


Figure 13 - Main Base Energy Distribution by Commodity FY10

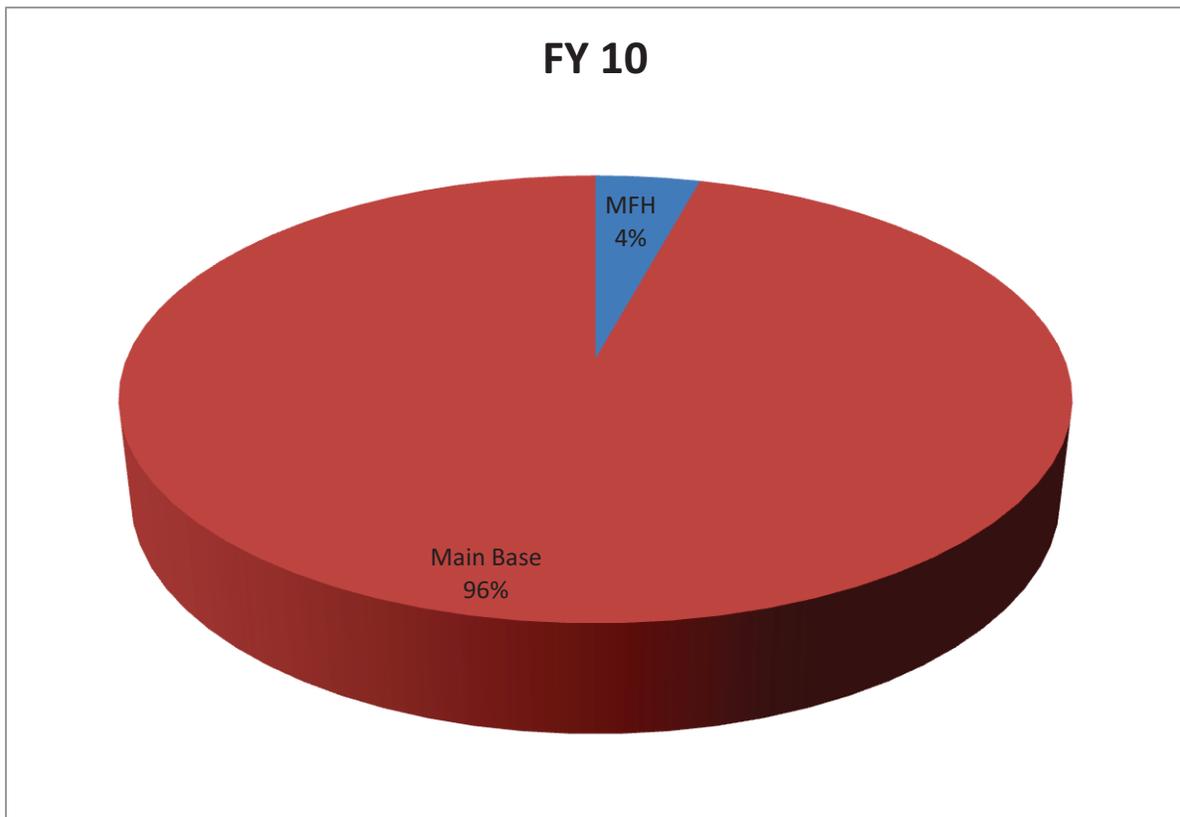


Figure 14 - Base Base vs MFH Energy Use

| FY | 2008 | 2009 | Annual reduction | 2009 | 2010 | Annual reduction |
|--------------------|-------------|-------------|-------------------------|-------------|-------------|-------------------------|
| Unleaded fuel Gals | 99,712 | 98,272 | 1,440 | 98,272 | 94,115 | 5,597 |
| Diesel fuel Gals | 109,803 | 107,365 | 2,438 | 107,365 | 104,956 | 2,409 |

Table 4 - Ground Fuel Consumption FY08-10

| | |
|---------------------------------|-------------------|
| Daily runs | 3 |
| Daily miles | 48 |
| Diesel/Gals | 4 |
| Cost per day | \$2.96 |
| Annual \$ Savings | \$5,397.00 |
| Annual fuel Savings/Gals | 1,040 |

Originally we had a driver making multiple trips to and from RAF Lakenheath, the intent of this was for members on official business, however the annual analysis showed the official ridership did not warrant the cost. Current State - We eliminated the shuttle run and re-assigned driver/vehicle to higher priority mission related work. reducing miles, time, and fuel consumption.

Table 5 - Lakenheath Shuttle Bus Fuel Savings

| | |
|---------------------------------|-------------------|
| Daily runs | 3 |
| Daily miles | 24 |
| Diesel/Gals | 2 |
| Cost per day | \$6.48 |
| Annual \$ Savings | \$2,698.00 |
| Annual fuel Savings/Gals | 520 |

Originally numerous drivers would make multiple trips to the flight kitchen to collect flight meals for the KC-135 crews that were flying.

Current State - We now send one driver/vehicle to collect all the meals for that day. reducing miles, time, and fuel consumption.

Table 6 - Aircrew Meal Collection

| | |
|---------------------------------|-----------------|
| Daily runs | 1 |
| Daily miles | 8 |
| Diesel/Gals | 0.7 |
| Cost per day | \$3.48 |
| Annual \$ Savings | \$904.00 |
| Annual fuel Savings/Gals | 173 |

Originally we had a dedicated driver who made one round trip a day for serviceable turn-ins. Current State - We have re-assigned that driver/van and have combined this task with the Documented Cargo run. We have reduced miles, time, and fuel consumption.

Table 7 - Serviceable Turn-Ins

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Appendices C through G have been removed from the original document.
Please direct any questions on these sections to the 100th ARW Public
Affairs office at UK 01638 542654.