Level 3

Bringing Sustainability to the Civil Air Patrol

Student's Guide

Introduction: This guide will help you understand sustainability and how the Civil Air Patrol can incorporate sustainable practices into its operations. The following sections summarize key concepts from the presentation and provide exercises for you to engage with the material.

DLOs

1. **Understand the Concept of Sustainability**:
    - Define sustainability and explain its relevance to the Civil Air Patrol.
2. **Identify Sustainability Efforts in CAP**:
    - Recognize how CAP's current missions contribute indirectly to sustainability.
    - Discuss potential sustainability policies CAP can adopt.
3. **Explore USAF and DoD Sustainability Policies**:
    - Analyze how USAF policies regarding energy efficiency, renewable energy, and environmental stewardship can be applied within CAP.
4. **Application to Local CAP Units**:
    - Develop practical ideas for making CAP's operations more sustainable, particularly in energy efficiency and reducing resource consumption.
    - Propose behavior and policy changes to make CAP a leader in sustainability.
5. **Collaboration and Leadership in Sustainability**:
    - Foster leadership skills by encouraging cadets to develop and lead sustainability projects within their units.

View PowerPoint (LINK)

1. **Key Definitions**:
    - **Sustainability**: Meeting the needs of the present without compromising the ability of future generations to meet theirs. It involves balancing environmental, economic, and social factors.
    - **CAP's Sustainability**: CAP can promote sustainability through energy-efficient operations, disaster response missions, and educating cadets on environmental stewardship.
2. **CAP's Current Contributions**:
    - Promoting energy efficiency.
    - Supporting environmental missions.
    - Educating cadets about sustainability-conscious leadership.
3. **The USAF's Approach to Sustainability**:
    - **Energy Efficiency & Renewable Energy**: Implementing solar, wind, and geothermal energy.
    - **Sustainable Aviation Fuel**: Reducing carbon emissions from aircraft.

- **Environmental Stewardship**: Managing resources responsibly to reduce impact on air, water, and land.

Activity:

- Write down three ways your local CAP unit could become more sustainable.
- Discuss how you could implement a small-scale sustainability project in your unit (e.g., weatherizing buildings or switching to energy-efficient lighting).

Test:

1. **What is sustainability?**
   a) Reducing energy use
   b) Meeting the needs of the present without compromising future generations
   c) Promoting economic growth
   d) Using fossil fuels responsibly

2. **Which of the following is a current sustainability effort of the U.S. Air Force?**
   a) Burning coal for energy
   b) Using sustainable aviation fuel
   c) Eliminating all fuel use
   d) Discontinuing aircraft maintenance

3. **How does CAP contribute to sustainability indirectly?**
   a) Promotes energy-efficient practices in aviation operations
   b) Shuts down all non-essential services during emergencies
   c) Limits its missions to reduce environmental impact
   d) Uses fossil fuels for all vehicle operations

4. **What behavior change could CAP implement to support sustainability?**
   a) Ignoring energy use
   b) Reducing energy use by installing energy-efficient lighting and insulation
   c) Using single-use plastics for all missions
   d) Switching entirely to manual labor for missions

5. **Which of the following could be a sustainability project for a CAP unit?**
   a) Encouraging paper waste to increase recycling opportunities
   b) Installing renewable energy systems, like solar panels, on CAP buildings
   c) Using older, less efficient vehicles to save money on new purchases
   d) Avoiding any focus on sustainability in favor of core emergency missions

Level 3

SustainableCAPability

"Bringing Sustainability to Civil Air Patrol"

DLOs

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  - **Define sustainability and explain its relevance to the Civil Air Patrol.**
- **Identify Sustainability Efforts in CAP:**
  - **Recognize how CAP's current missions contribute indirectly to sustainability.**
  - **Discuss potential sustainability policies CAP can adopt.**
- **Explore USAF and DoD Sustainability Policies:**
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- **Application to Local CAP Units:**
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  - **Propose behavior and policy changes to make CAP a leader in sustainability.**
- **Collaboration and Leadership in Sustainability:**
  - **Foster leadership skills by encouraging cadets to develop and lead sustainability projects within their units.**

Video Link: https://youtu.be/0NFg9XtDGx0

Discussion

- **Defining Sustainability: What does sustainability mean to you? How can we apply it in CAP's day-to-day operations?**
- **USAF Sustainability Initiatives: How has the U.S. Air Force implemented sustainability? What can CAP learn from these efforts?**
- **CAP's Role in Environmental Stewardship: How can CAP expand its current operations to better protect the environment? Can CAP engage in more proactive sustainability projects?**
- **Behavior Changes and Policy: What behavior changes would be necessary to support sustainability in CAP? How could CAP introduce new policies to promote sustainability?**
- **Small, Immediate Actions: Discuss the "low-hanging technology" solutions mentioned in the presentation (e.g., lighting, caulking, weatherization). How could these be applied in CAP meeting areas?**

Test p. 1

- **What is sustainability?**
  a) Reducing energy use
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  d) Using fossil fuels responsibly
  Answer: b) Meeting the needs of the present without compromising future generations
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  Answer: b) Using sustainable aviation fuel

Test p2

- **How does CAP contribute to sustainability indirectly?**
  a) Promotes energy-efficient practices in aviation operations
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  d) Uses fossil fuels for all vehicle operations
  Answer: a) Promotes energy-efficient practices in aviation operations
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  Answer: b) Reducing energy use by installing energy-efficient lighting and insulation

Test p3

- **Which of the following could be a sustainability project for a CAP unit?**
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  Answer: b) Installing renewable energy systems, like solar panels, on CAP buildings

Conclusion

- What questions do you have?

Level 3 Bringing Sustainability to the Civil Air Patrol

Instructor's Guide

Bringing Sustainability to the Civil Air Patrol

DURATION: 60 Minutes

TEACHING METHOD: Multimedia and Discussion

READING: Student Reading of Booklet

LESSON OBJECTIVE: Possibilities for Sustainability in the Civil Air Patrol

DESIRED LEARNING OUTCOMES (DLO):

1. **Understand the Concept of Sustainability**:
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   - Propose behavior and policy changes to make CAP a leader in sustainability.
5. **Collaboration and Leadership in Sustainability**:
   - Foster leadership skills by encouraging cadets to develop and lead sustainability projects within their units.

Objective: Guide CAP cadets to understand sustainability and how it can be applied within CAP operations.

1. **Lesson Overview**:
   - **Introduction** (5 minutes): Briefly define sustainability, its importance, and how it applies to CAP's missions.
   - **Key Concepts – PowerPoint and Discussion** [LINK] (30 minutes):
     - Definition of Sustainability
     - CAP's current indirect sustainability efforts, such as energy efficiency and environmental stewardship.
     - U.S. Air Force sustainability initiatives and how CAP can adopt similar strategies.

    - **Discussion & Activities** (15 minutes): Engage cadets in discussing CAP-specific sustainability projects.
    - **Wrap-Up & Questions** (10 minutes): Recap and answer student questions.
2. **Materials Needed**:
    - PowerPoint presentation.
    - Whiteboard or flip chart for capturing student ideas.
    - Sustainability scenarios for group activities.
3. **Learning Outcomes**:
    - Understand key sustainability concepts and how they apply to CAP.
    - Identify ways to integrate sustainability into CAP operations.
    - Discuss examples of sustainability from the U.S. Air Force and Department of Defense.
4. **Suggested Activities**:
    - **Case Study Review**: Present examples of successful sustainability projects in aviation or emergency services.
    - **Group Project**: Propose a sustainability initiative for your local CAP unit.

Test Questions & Answers:

1. **What is sustainability?**
   a) Reducing energy use
   b) Meeting the needs of the present without compromising future generations
   c) Promoting economic growth
   d) Using fossil fuels responsibly
   Answer: **b) Meeting the needs of the present without compromising future generations**
2. **Which of the following is a current sustainability effort of the U.S. Air Force?**
   a) Burning coal for energy
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   b) Reducing energy use by installing energy-efficient lighting and insulation
   c) Using single-use plastics for all missions
   d) Switching entirely to manual labor for missions
   Answer: **b) Reducing energy use by installing energy-efficient lighting and insulation**

5. **Which of the following could be a sustainability project for a CAP unit?**
   a) Encouraging paper waste to increase recycling opportunities
   b) Installing renewable energy systems, like solar panels, on CAP buildings
   c) Using older, less efficient vehicles to save money on new purchases
   d) Avoiding any focus on sustainability in favor of core emergency missions
   Answer: **b) Installing renewable energy systems, like solar panels, on CAP buildings**

Accompanying video https://youtu.be/0NFg9XtDGx0

CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

SustainableCAPability
"Bringing Sustainability to Civil Air Patrol"

CAPStone
October 20, 2024
Major John H. Martin, EdD.

Sustainability is the practice of meeting the needs of the present without compromising the ability of future generations to meet their own needs.

It involves balancing environmental, social, and economic factors to ensure long-term health and resilience for both human societies and the planet.

This concept emphasizes the responsible use of natural resources, minimizing waste, and promoting renewable energy, while also fostering social equity and economic stability.

Sustainability is not just about "going green"; it's about securing our future and supporting the Civil Air Patrol's everyday activities and long-term goals.

We aim to implement changes that are practical, scalable, and aligned with U.S. Air Force and Department of Defense sustainability policies.[1]

At its core, sustainability ensures that the resources we use today are available for future generations. In the Civil Air Patrol, this means making conscious choices in our operations—from aviation to logistics—that minimize waste and maximize efficiency.

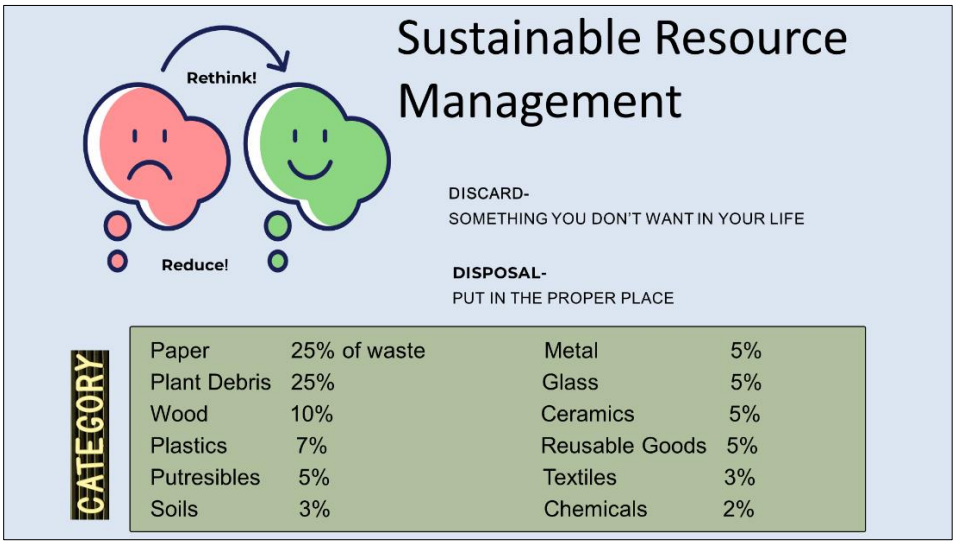
Sustainability Efforts and Policies

The U.S. Air Force and Department of Defense pursue various sustainability goals, which the Civil Air Patrol can adopt in the future. These goals include energy efficiency, renewable energy

[1] See Appendix 1.

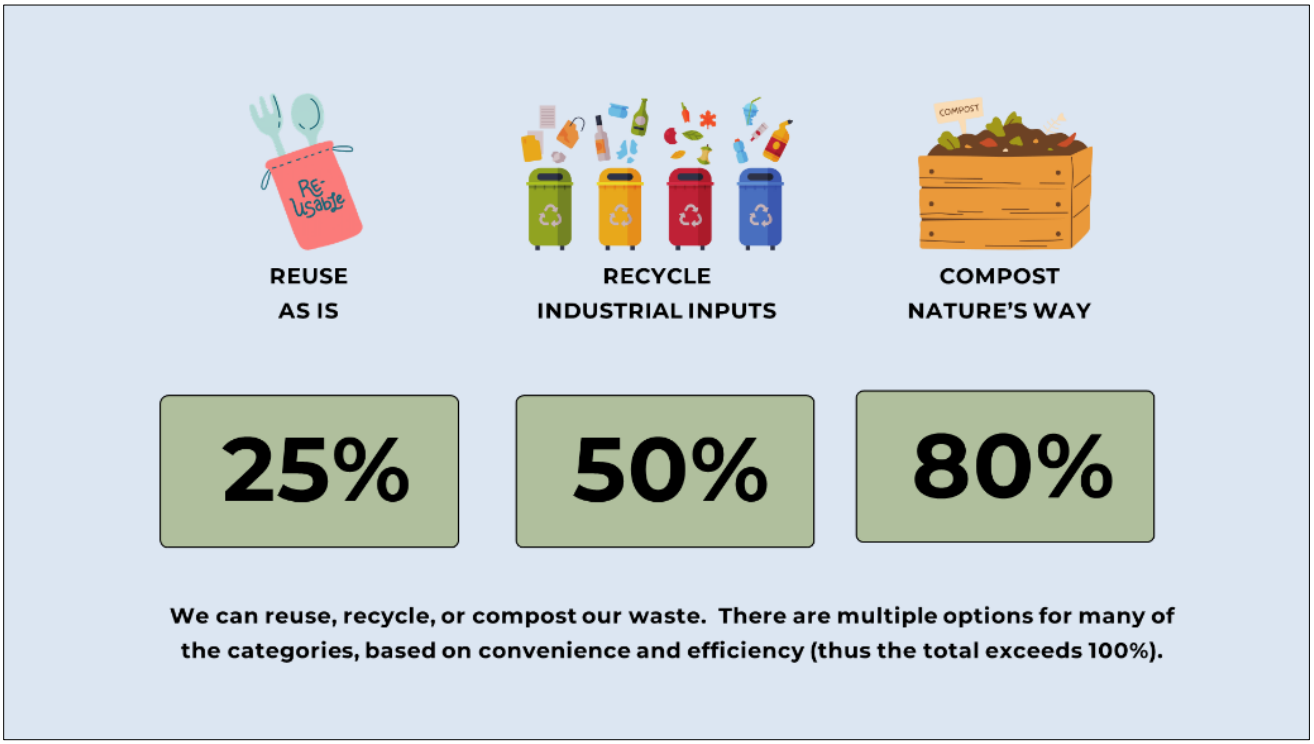
use, sustainable aviation fuel, environmental stewardship, energy resiliency and security, sustainable infrastructure, climate change adaptation, recycling, and waste reduction. These initiatives align with broader U.S. federal goals of reducing greenhouse gas emissions and enhancing resilience to environmental changes.

The Civil Air Patrol can promote energy efficiency in its operations, reduce environmental emissions, and educate cadets and members about sustainability.



Sustainable Resource Management

Effective resource management is one key to sustainability. The Civil Air Patrol can implement waste reduction practices, reuse materials, and recycle wherever possible. For example, we can hold zero-waste events by eliminating single-use items, encouraging recycling and composting, and educating members on reducing waste in their daily lives.



Water/Waste Water

Water conservation and treatment is another area where we can improve. By collecting, treating, and reusing water more efficiently, we can lower our water consumption and operating costs. The image below shows a few examples of how we can manage water resources.

Energy Efficiency Solutions

Some of the most immediate improvements we can make involve low-cost, high-impact technology solutions. Upgrading lighting, adding caulking, installing door sweeps, and using movable insulation are simple changes that can greatly reduce energy consumption. Weatherization projects, such as improving insulation and sealing air leaks, are some of the easiest ways to reduce energy costs. By ensuring our buildings are well-insulated and energy-efficient, the Civil Air Patrol can lower utility expenses and reduce its carbon footprint.

Below are some examples of energy-efficient equipment we can adopt.

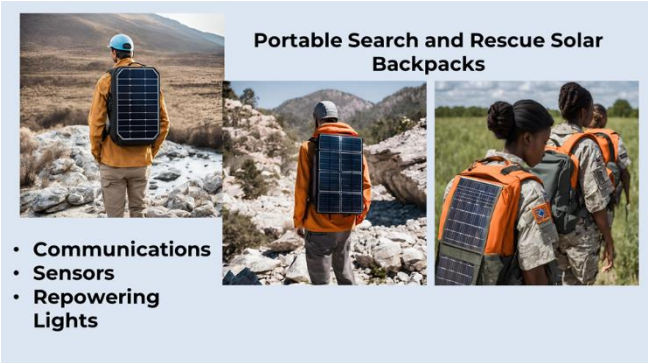
Energy-Efficient Equipment

- heat pumps/air conditioners
- water pumps
- refrigerators
- ice makers and ice houses
- induction stoves
- water purifiers
- waste water aerators
- laundry washers
- medical equipment

Renewable Energy Adoption

By adopting renewable energy sources like solar and wind, the Civil Air Patrol can take the next step in its sustainability journey. These clean energy sources are becoming increasingly affordable and can help reduce our dependence on fossil fuels.

For example, the Air Force uses shelters powered by renewable energy. In the future, we may explore innovative structures like barn-shaped, cone-shaped, sphere-shaped, or pyramid-shaped buildings to enhance energy efficiency.

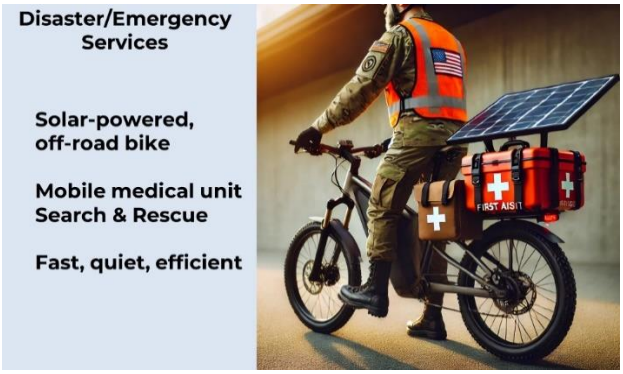


Portable Power Units

Portable solar-powered generators can provide renewable energy in the field. These units can be carried on backpacks and used for communication, sensors, and lighting, or they can scale up for better storage and more power. The possibilities are vast.

Solar-Powered Off-Road Bike and Trailer

The solar-powered off-road bike and trailer offer innovative solutions for remote and rugged terrain. These units are versatile, making them ideal for search-and-rescue missions, delivering supplies, or transporting communication equipment.



Disaster Response

Disaster response is a critical area where the Civil Air Patrol can incorporate sustainability. By using portable solar units, electric vehicles, and renewable energy-powered shelters, we can enhance our ability to provide long-term support during emergency operations.

Sustainability in Aerospace

Sustainability in aerospace includes using solar-powered space craft for communication, GPS, and weather imaging. These craft can fly for long durations without fuel, providing essential information. Small solar-powered drones can also be used for search-and-rescue operations, delivering supplies, and gathering data in inaccessible areas.

Future improvements may include advanced sensors to assist in complex missions and long-duration drones equipped with solar panels. These drones will be critical for future CAP aviation operations, staying airborne for extended periods and providing information and support without traditional fuel sources.

Electric Aircraft

The U.S. Air Force, Space Force, and Civil Air Patrol can also explore electric aircraft and hybrid systems. These will require charging infrastructure. Investing in solar-powered charging stations for our aircraft will ensure operational readiness while reducing and eliminating reliance on fossil fuels.

One example is a solar-powered plane that has been operational for over two decades.

Next Steps

Our suggested next steps include defining Civil Air Patrol policy, creating a task force, increasing education efforts, conducting audits, and launching pilot programs for wins. Our reliance on fossil fuels can be replaced by renewable energy within a 10-year timeframe, funded by using fewer resources than we do now.

Resources and References

Sustainability
https://www.sustainablejack.com

Sustainable NASA "Preserving the Cosmos" 1:48
https://www.youtube.com/watch?v=s1oCsdxRyaY&t=9s

Electric and solar aircraft

First sunseeker duo flight. 3:49
https://www.google.com/search?client=safari&rls=en&q=Sunseeker+duo+pic&ie=UTF-8&oe=UTF-8#fpstate=ive&vld=cid:123f208f,vid:cbDv38aI_l8,st:0

Electric Beaver Amphibian 36:15 https://www.youtube.com/watch?v=GvKm6rp9tyg&t=120s

P 2 Xcursion Amphibian. 5:35 https://www.youtube.com/watch?v=0a-7FY33y_I
USAF electric dreams video. 15:50 https://www.youtube.com/watch?v=Xug8WE2qJoU

Regent Seaglider. 1:23 https://www.youtube.com/watch?v=Ka1GpNGdjXM

Elon University Drone day presentations 2021, 2022, 2023 webpage with videos 25,34,27 min.
https://www.elon.edu/u/academics/communications/elon-drone-day/2023-elon-drone-day/

6 seat Solar Aircraft concept video. 2:06 https://www.youtube.com/watch?v=h-4bwyR5SvU

These Smallest eVTOLs are the Future Ultralight Aircraft 18:59
https://www.youtube.com/watch?v=p5EVP7FmuSw

Solar Drone article
https://www.maxongroup.com/en-in/knowledge-and-support/blog/xsun-a-self-contained-solar-powered-drone-172862

Drone in a Box article https://www.commercialuavnews.com/international/sky-solutions-offers-an-autonomous-solar-powered-drone-in-a-box

Zipline drone video. 11:28 "
https://www.youtube.com/watch?v=4C8s6CmcJcQ

Electric Search and Rescue

Electric Search and Rescue Light Electric Vehicles. 1:24
https://www.youtube.com/watch?v=8yM7rYa9zp4

Search and Rescue E-bike Team. 2:13 "
https://www.youtube.com/watch?v=twkNoXlgskY

Light Solar Vehicles PowerPoint

Appendix 1

The **U.S. Air Force (USAF)** has a strong commitment to sustainability, reflected in its various policies and initiatives. The Air Force emphasizes sustainability as part of its mission to ensure energy security, environmental stewardship, and readiness for future operations.

Key elements of the USAF's sustainability policy include:

1. Energy Efficiency and Renewable Energy

- The Air Force seeks to reduce its reliance on fossil fuels by increasing energy efficiency and adopting renewable energy sources.
- USAF is investing in **solar, wind, and geothermal energy** projects on its bases to reduce energy consumption and enhance resilience to energy disruptions.

2. Sustainable Aviation Fuel (SAF)

- The USAF is exploring the use of **sustainable aviation fuel** to decrease carbon emissions from its fleet.
- It partners with industry & research institutions to develop alternative environmentally friendly fuels.

3. Environmental Stewardship*

- The Air Force integrates **environmental protection** into its operations by managing water resources, waste, and hazardous materials responsibly.
- USAF adheres to strict environmental regulations to minimize its impact on air, water, and land.

The Air Force also engages in **habitat and species conservation**, especially on or near its installations.

4. Energy Resilience and Security

- To ensure operational readiness, the USAF focuses on **energy resilience**, ensuring that critical missions can continue in the event of power disruptions.
- It works to secure its energy infrastructure, such as installing microgrids and on-site energy generation systems, to reduce vulnerabilities.

5. Sustainable Infrastructure

- The Air Force is committed to constructing **energy-efficient buildings** and retrofitting existing structures to meet modern sustainability standards.
- The Air Force Civil Engineer Center (AFCEC) leads efforts to ensure that new infrastructure incorporates green building standards like **LEED (Leadership in Energy and Environmental Design)**.

6. Climate Change Adaptation

- The USAF recognizes climate change as a threat to national security and is working to **adapt its operations and infrastructure** to the changing environment.

- The Air Force's efforts align with broader Department of Defense (DoD) policies, which prioritize resilience to extreme weather and climate-related risks.

7. Recycling and Waste Reduction

- The Air Force promotes **waste reduction, recycling**, and responsible disposal of hazardous materials as part of its everyday operations.

The USAF's sustainability efforts are part of a larger **Department of Defense (DoD) strategy** to reduce the environmental impact of military operations while maintaining mission readiness. These initiatives are consistent with the **U.S. federal government's broader goals** for reducing greenhouse gas emissions and enhancing resilience to environmental changes.

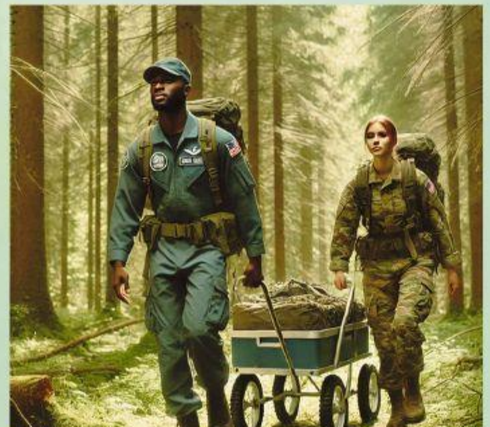
SustainableCAPability

"Bringing Sustainability to Civil Air Patrol"

https://sustainablejack.com/

jack@sustainablejack.com

Bringing Sustainability to CAP



CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

SustainableCAPability
"Bringing Sustainability to Civil Air Patrol"

CAPStone Project
by Major John H. Martin
2024

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Sustainability Efforts and Policies

- US Air Force
- Department of Defense
- Civil Air Patrol

The U.S. Air Force (USAF) has a strong commitment to sustainability, reflected in its various policies and initiatives. The Air Force emphasizes sustainability as part of its mission to ensure energy security, environmental stewardship, and readiness for future operations.

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(continued on next slide)

U.S. AIR FORCE

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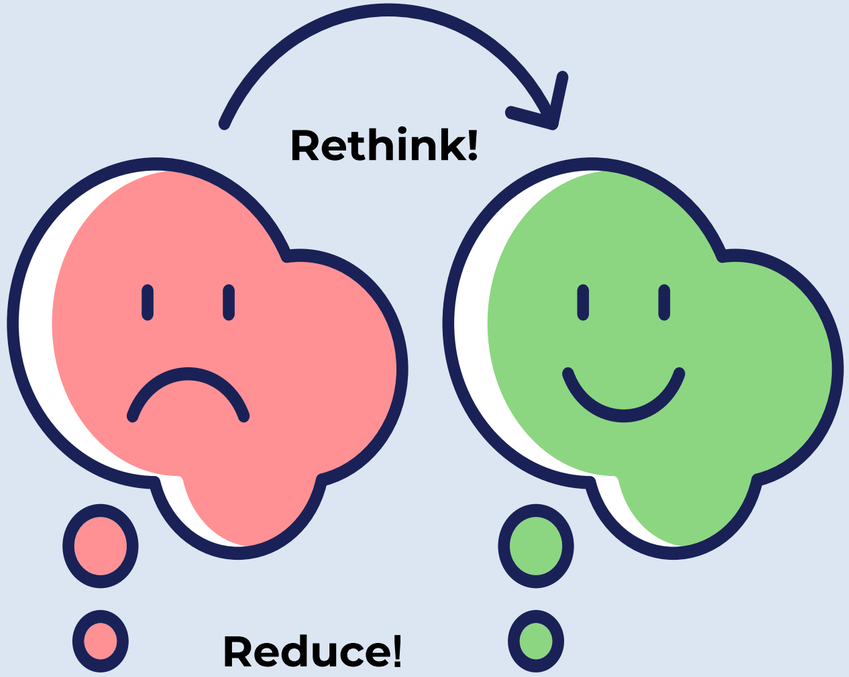
CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

The Civil Air Patrol (CAP), as a volunteer organization focused on aviation and emergency services, does not have a widely publicized or specific sustainability policy in the same way that large corporations or governmental agencies might. However, CAP engages in activities that contribute indirectly to sustainability, such as:

1. Promoting Energy Efficiency in Operations: CAP could implement energy-efficient practices in aviation operations, aircraft maintenance, and vehicle use. As aviation is a major aspect of CAP's mission, fuel-efficient practices and technology adoption may be promoted in line with general aviation sustainability trends.
2. Environmental Missions: CAP supports disaster response and conducts aerial surveys, which help monitor and mitigate the environmental impact of natural disasters. These missions can help preserve ecosystems by preventing further damage and guiding restoration efforts.
3. Cadet and Member Education: CAP promotes leadership and education, including awareness of environmental stewardship. Through its programs for cadets, there is an opportunity to foster sustainability-conscious leadership in future generations.

Sustainable Resource Management



DISCARD-

SOMETHING YOU DON'T WANT IN YOUR LIFE

DISPOSAL-

PUT IN THE PROPER PLACE

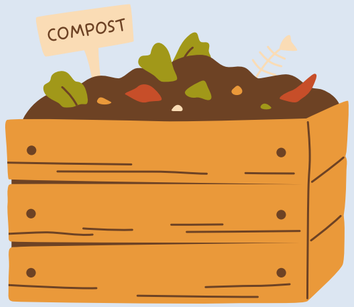
CATEGORY			
Paper	25% of waste	Metal	5%
Plant Debris	25%	Glass	5%
Wood	10%	Ceramics	5%
Plastics	7%	Reusable Goods	5%
Putresibles	5%	Textiles	3%
Soils	3%	Chemicals	2%

REUSE
AS IS

25%

RECYCLE
INDUSTRIAL INPUTS

50%



COMPOST
NATURE'S WAY

80%

We can reuse, recycle, or compost our waste. There are multiple options for many of the categories, based on convenience and efficiency (thus the total exceeds 100%).

zero-waste events

A **zero waste event** is one where all materials used are either reused, recycled, composted, or minimized, reducing the amount of waste sent to landfills. CAP should aim for zero waste to align with its environmental stewardship goals, reduce operational costs, and set a leadership example for cadets and the community. Duration of zero-waste events can be half a day or several weeks.

Water/Waste Water

Collect

Treat

Use


LifeStraw
SQUEEZE
LIFETIME WARRANTY
SAWYER
OZARK TRAIL
5-GALLON SOLAR SHOWER

Examples

Increasing Energy Efficiency: Weatherization Projects

Low hanging technology – lighting, caulking, door sweeps, sealing, weatherization, movable insulation, curtains

Energy-Efficient Equipment

- heat pumps/air conditioners
- water pumps
- refrigerators
- ice makers and ice houses
- induction stoves
- water purifiers
- waste water aerators
- laundry washers
- medical equipment

Shelters

Small Portable Power

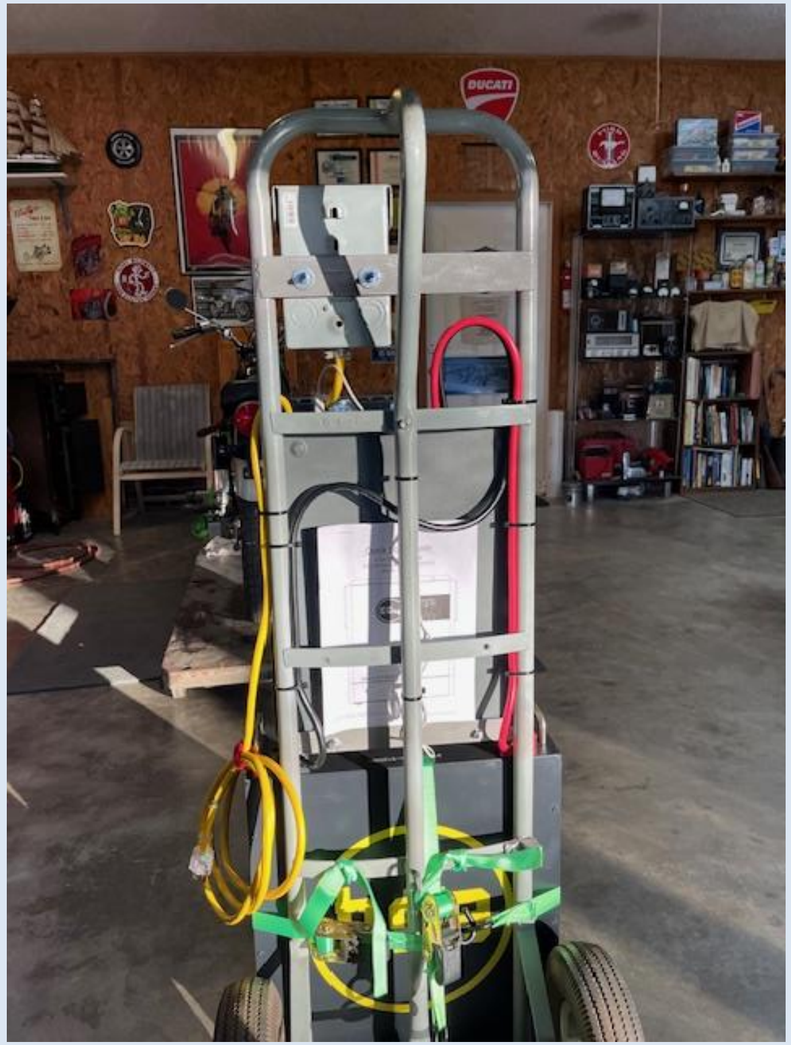
Portable Search and Rescue Solar Backpacks

- Communications
- Sensors
- Repowering Lights

Portable unit (130 pounds)

5kw storage

3kwh inverter



More concepts for mid-sized portable solar units


5 kw Solar Array
Measures 4 meters x 5 meters when deployed
Fits in a pickup truck or small trailer when configured for travel

Disaster/Emergency Services

Solar-powered, off-road bike

Mobile medical unit Search & Rescue

Fast, quiet, efficient

Trailer that can be human or bicycle-powered

Can carry

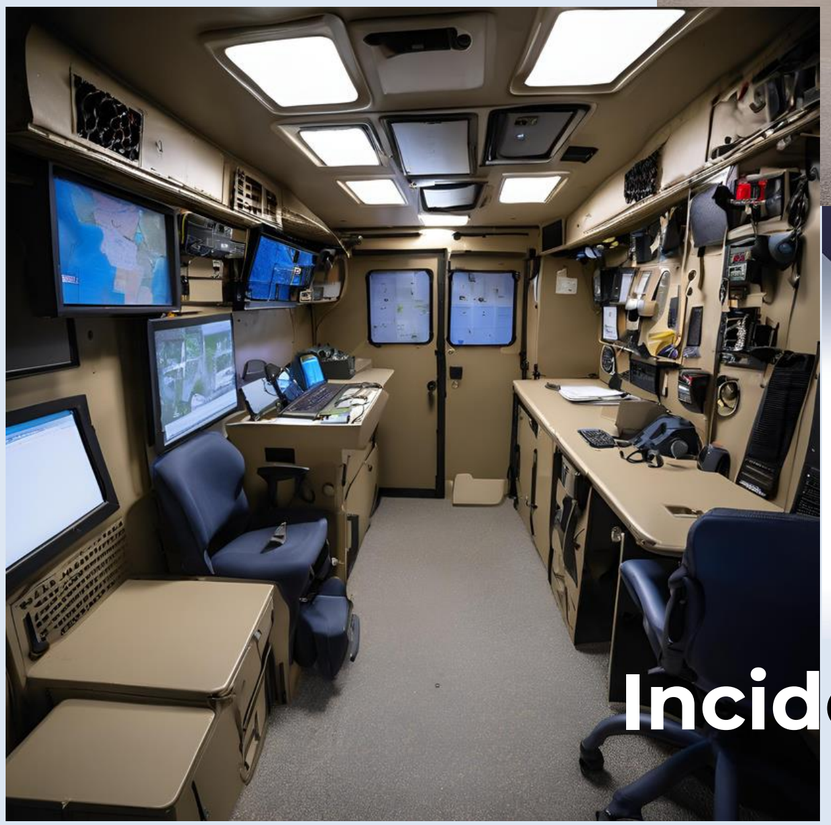
- **communications**
- **first aid**
- **bivouac**
- **water**
- **food**
- **sanitation &**
- **shelter**

Can act as a litter

For bigger, longer lasting events....

Vans/trucks
– E-85 hybrid

Electric & solar

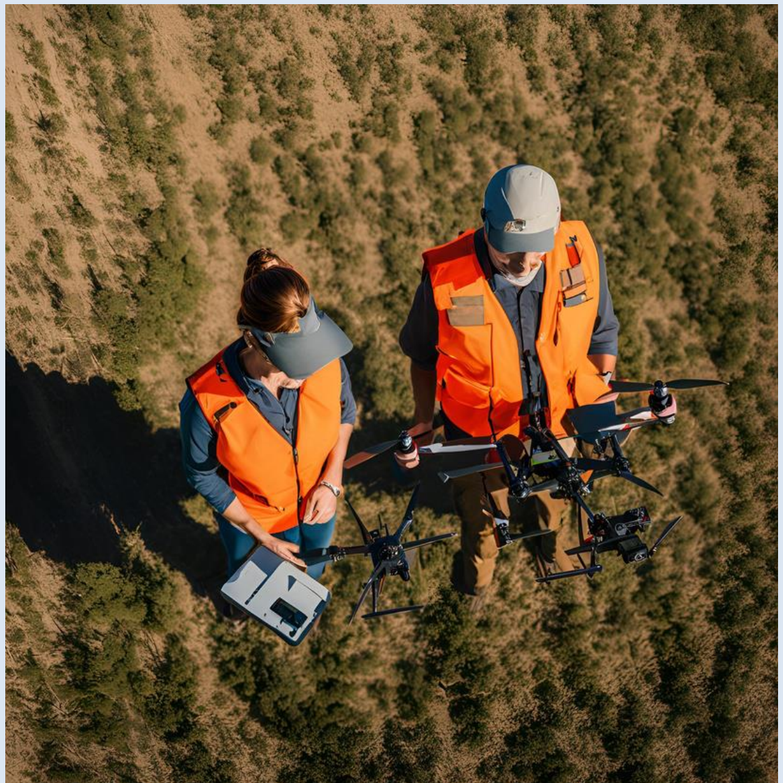


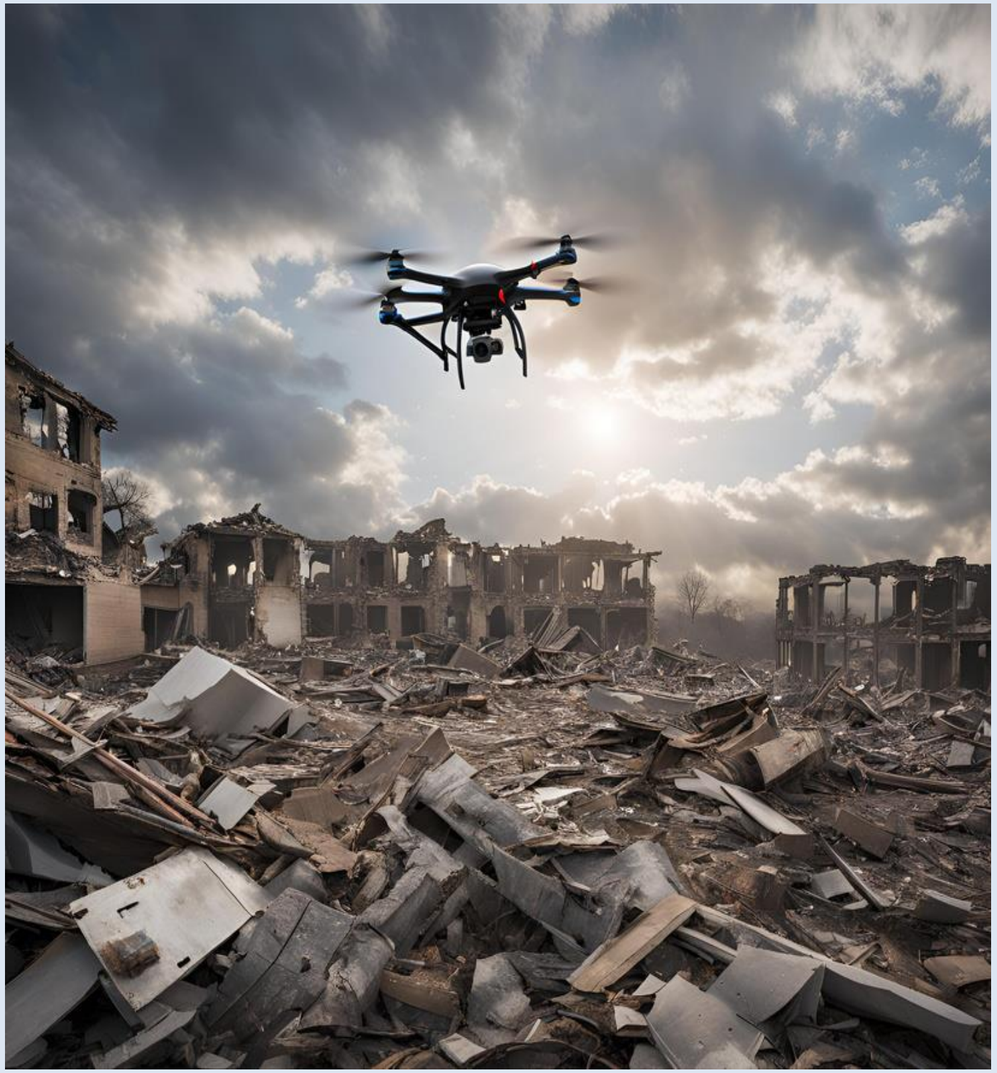
Incident Command

Aerospace: Communications, GPS, Weather, Imaging

Small Personal Drones for Imaging, Search & Rescue, and Delivery

In the future, they will have a sensory suite of multiple capacities of vision (infrared, etc.), pressure, enhanced auditory services, speaking, smell and taste (for chemicals).






COVID-19
Vaccine

A long duration drone with solar panels

Electric Airplanes


CIVIL AIR


Sunseeker duo
Solar Airplane

Suggested Next Steps

Step 1 : Create a CAP Sustainability Policy

Step 2 : Create a task force of stakeholders.

Step 3 : Education about sustainability

Step 4 : Sustainability Audits

Step 5 : Pilot Programs for Wins

SustainableCAPability

"Bringing Sustainability to Civil Air Patrol"

Present State- Fossil fuels

Preferred State- Renewable Energy

Timeline- Ten Years

Budget- Less than used now

Key Resources-

For More Information....

Sustainability

https://www.sustainablejack.com

https://www.youtube.com/watch?v=s1oCsdxRyaY&t=9s
Sustainable NASA “Preserving the Cosmos” 1:48 “

Electric and solar aircraft

https://www.google.com/search?client=safari&rls=en&q=Sunseeker+duo+pic&ie=UTF-8&oe=UTF-8#fpstate=ive&vld=cid:123f208f,vid:cbDv38aI_l8,st:0
first sunseeker duo flight. 3:49 “

https://www.youtube.com/watch?v=GvKm6rp9tyg&t=120s
Electric Beaver Amphibian 36:15 “

https://www.youtube.com/watch?v=0a-7FY33y_I
P 2 Xcursion Amphibian. 5:35 “

https://www.youtube.com/watch?v=Xug8WE2qJoU
USAF electric dreams video. 15:50 “

https://www.youtube.com/watch?v=Ka1GpNGdjXM
Regent Seaglider. 1:23 “

https://www.elon.edu/u/academics/communications/elon-drone-day/2023-elon-drone-day/
Elon University Drone day presentations 2021, 2022, 2023 webpage with videos 25,34,27 min

https://www.youtube.com/watch?v=h-4bwyR5SvU
6 seat Solar Aircraft concept video. 2:06 “

https://www.youtube.com/watch?v=p5EVP7FmuSw
These Smallest eVTOLs are the Future Ultralight Aircraft 18:59 “

https://www.maxongroup.com/en-in/knowledge-and-support/blog/xsun-a-self-contained-solar-powered-drone-172862
Solar Drone article

https://www.commercialuavnews.com/international/sky-solutions-offers-an-autonomous-solar-powered-drone-in-a-box
Drone in a Box article

https://www.youtube.com/watch?v=4C8s6CmcJcQ
Zipline drone video. 11:28 “

Electric Search and Rescue

https://www.youtube.com/watch?v=8yM7rYa9zp4
Electric Search and Rescue Light Electric Vehicles. 1:24 “

https://www.youtube.com/watch?v=twkNoXlgskY
Search and Rescue E-bike Team. 2:13 “

Light Solar Vehicles PowerPoint

Thank you very much!

https://sustainablejack.com/

jack@sustainablejack.com

Other Capstone Opportunities

• Interface for Continuing Ed tracking (all level and specialty track modules are organized by instructor or student preference and made available to be printed and placed into a notebook by third party via internet.

• A personal CAP chest wing Space Force Communicator Badge.(101 card replacement)
The CAP logo with a USB/c connection. Provides GPS, LoJack, RFID, Radio Direction finde. Recognizes Bluetooth, Siri, Alexa . Example- Pilot uses computer system to file a flight plan A-B-C-A. All info is downloaded, frequencies, emergency backups etc. Pilot puts wing on chest gets into aircraft places chip on joy stick-downloads to aircraft. It saves pilot's personal preferences, checks compatibility of pilot to craft, records, logs operations, and closes flight plan at end of trip. Mission Observer can enter incident command, present badge, get mission material and place badge on joystick with all required info for mission which is recorded and downloaded upon return. sUAS pilots and tech use their badges in a similar manner as do vehicle drivers. Personal logs. New CAP personal will use these to accomplish level and Specialty Track proficiency and help them recognize nearby mentors

• Connect US Space Academy for Educators (Huntsville Alabama) with Civil Air Patrol (Maxwell Air Force Base, Alabama). Great sharing of expertise and Aerospace. ALeX, AEX

• Sky Power for the People

• Renewable Energy, Continuing Education course, Alamance Community College

Bringing Sustainability to Civil Air Patrol

Packing List

Phone and laptop

Badge gimmick

Sustainable resource yardstick

Water filtration materials

Caulk gun

Insulation

Thermostat

Power timer

Small 30-watt solar panel

Solar backpack

120-watt solar panel

Light inverter

200-watt folding solar watt

600-watt inverter

Aircraft display

Prints of the packet including the booklet

Print-out of safety paper about batteries

Sky Power for the People print-out

Solar bike and trailer print-out