

SECRETARY OF THE ARMY ENVIRONMENTAL AWARDS 2022

COLORADO ARMY NATIONAL GUARD ENVIRONMENTAL QUALITY, NON-INDUSTRIAL INSTALLATION



Over the past two years, the statewide Environmental Quality program for the Colorado Army National Guard (COARNG) has forged ahead on ambitious initiatives to transform the organization for long-term resilience and comprehensive compliance. Driven by the priorities of the state's environmental management system (eMS), the Environmental Quality (EQ) staff have integrated energy use reduction, waste minimization and greater diversion, and introduction of greener technologies, particularly for the COARNG fleet. In many respects, the COARNG has been the agency to pave the path for other state agencies to follow, pioneering solutions that enable technology adoption and expansion.

The COARNG installation supports nearly 4,000 soldiers in 31 units, including some of the most modern, cutting-edge, and high-tech missions, from space support to classic, hard-charging infantry. The EQ program encompasses every aspect of the installation, comprising 37 state armories, training sites, and support facilities. Guided by a comprehensive Cross Functional Team (CFT) that encompasses an engaged Environmental Quality Control Committee (EQCC), the EQ program is fully embedded to achieve objectives delineated in the eMS with enduring results.



To achieve eMS objectives, the EQ program has taken a multi-faceted approach, blending initiatives like integration of photovoltaic solar resources to reduce energy use and establish renewable energy resources with efforts to create the infrastructure that will support a transition to electric fleets statewide. The COARNG aggressively pursued funding and administrative resolutions to install the necessary charging stations at the Joint Force Headquarters and high-density logistic nodes and to resolve funding and cost conflicts that could have stymied this progress. The EQ program's efforts have long-reaching ramifications, serving as the template for other state agencies to follow. Last year, a new 150kW solar installation was installed, allowing the COARNG to achieve the utility use reductions specified in the state's Energy and Water Management Plan. With this plan as a guiding structure, the EQ program is now validating the COARNG's critical facilities to design a comprehensive resiliency package encompassing all operations in the event of emergency response or loss of utilities. This year, the installation is completing an energy audit and advanced metering project at all facilities to provide a baseline that will empower even more targeted projects to reduce energy and water use. Additionally, the COARNG is executing a Statewide water audit that will establish how the units use water in all buildings, which will identify opportunities for water saving efforts and projects, furthering the push for more sustainable facility footprint.

The EQ program is championed by the COARNG's Cross-Functional Team (CFT), a 15-member group that incorporates the EQCC and staff from Major Subordinate Command representatives, Environmental, Facilities Management, G-5, Surface Maintenance Management, and DMVA strategic planners. The COARNG's Environmental office, where many EQ initiatives are developed and deployed, has been structured as the Environmental, Energy and Engineering (E3) Branch, which enables cohesive approaches to the mutually reinforcing elements of sustainability, energy, and compliance. At each facility throughout the statewide installation, the CFT and EQ program's projects and policies are carried out by environmental



Program Management



Technical Merit



Orientation to Mission



Transferability



Stakeholder Interaction



Program Impact



compliance officers and facility environmental coordinators. This multi-directorate approach to EQ management ensures total buy-in and support at every level of the COARNG, from Command leadership to facility shop staff, with eMS goals fully embedded.

The EQ staff and CFT work closely with regulatory agencies in the state to preserve an impeccable compliance record. CFT members serve on the State Governing Council for establishing the Colorado Green Team goals and synchronizing state and federal eMS programs. The COARNG also works closely with the National Renewable Energy Lab (NREL) in Golden, Colorado, to pilot energy conservation initiatives and validate energy solutions. EQ staff participate on the state's Resiliency Working Group to implement a statewide resiliency plan. These relationships have helped the EQ program to advance electric vehicle infrastructure as well. In these ways, the COARNG is not just meeting regulatory requirements, but in fact helping to establish those requirements. Compliance is further maintained by following the existing eMS, sustainability, energy, water, and hazardous waste plans already established for the installation.

Finding cost effective ways to accomplish their mission is another hallmark for the COARNG. Their promotion of renewable energy and energy use reduction create direct cost savings for the organization. In 2020, the EQ program pursued an energy infrastructure investment opportunity leveraging third party funding with the Xcel Energy Electric Vehicle Supply Infrastructure Program to roll out charging stations to nine additional locations throughout the state. Under this agreement, Xcel Energy provides the segment of the distribution system from the traditional point of utility service all the way to the EV charging station connection as well as metering and utility special rate for operation of the stations. When completed, the COARNG will manage the hardware, installation, operations and maintenance costs. In their analysis, the COARNG considered each electric vehicle introduced to the fleet would be driven 9,000 miles per year, creating an annual estimated cost savings of \$2000 per vehicle in reduced fuel and maintenance.

In 2019, Colorado Governor Jared Polis signed an executive order (Colorado State EO D2019-016) setting new goals and directives for sustainable government operations. This executive order required each State Agency and Department to appoint one representative to the Greening Government Leadership Council (GGLC), which is tasked to achieve the following goals:

- Reduce greenhouse gas emissions by at least 10% from a FY14/15 baseline by the end of FY22/23.
- Reduce facility energy consumption (per square foot) by at least 15% by FY 22/23
- Increase the percentage of renewable electricity consumed by state facilities to at least 5%
- Reduce greenhouse gas emissions from State fleet vehicles by at least 15% by FY22/23.

To reinforce these goals in the governor's executive order, the Colorado TAG established additional Wildly Important Goals (WIGs) for the Department of Military Affairs (DMVA) and the COARNG:

- Developing an energy and stewardship policy (complete).
- Collaborating with Army Corps of Engineers on metering projects (ongoing).
- Installing 150 kW PV at Fort Lupton, which includes leveraged SEP funding and federal match (complete).



- Reducing petroleum consumption through the fielding of three zero emission vehicles (ongoing).
- Evaluating lighting retrofit to LED for both interior and exterior fixtures (complete).
- Exploring opportunities for leveraging third party funding through an energy performance contract (in progress).

The eMS is the organizing force to meet these goals, placing energy and water use reduction and solid waste diversion at the core of operations. The EQ program has approached these goals expansively, however, pursuing projects like electric fleet conversion in the spirit of resiliency and resource conservation as well as projects to expand renewable energy.

Energy Use Reduction: Several years ago, the CFT wrote a Facilities Energy and Water Management Plan (EWMP), calling for energy intensity use reduction of 2.5% and water use intensity reduction of 2% each year. The COARNG is on track to meet or exceed the 15% energy reduction target by FY23. The completion of energy audits this year and water audits next year

are important steps in validating the work done so far across the statewide installation and confirming where further gains can be made.

A 150kW solar field was installed at Fort Lupton Readiness Center in 2020, which offsets 100% of the facility’s annual electric consumption. The EQ program, however, built in planning and programming for future development at this site, including electric vehicle charging, battery energy storage, additional PV for future expansion, smart electric panel solutions, digitalization and power monitoring solutions, micro-grid and Distributed Energy Resources (DER), generator expansion, and LED lighting retrofits. All proposed technologies and strategies associated with this project are scalable and replicable to other COARNG locations. The EQ Program leveraged Federal funds against nearly a 50% match from the State of Colorado Supplemental Environmental Program (SEP) to design and build the system. At another six locations, the EQ Program completed design on the exterior lighting system to evaluate conversion to LED (as well as necessary ATPF enhancements). Additional sites were evaluated and programmed for a full LED retrofit to be completed on

interior and exterior lights by June 2024. Through funding leveraged through a US Army Corps of Engineer (USACE) contracting vehicle, over a dozen COARNG facilities are receiving meters capable of providing real-time interval data, which empowers the EQ program to track gas, water, and electric meters connected and reporting to the Army Meter Data Management System (MDMS).



A newly installed photovoltaic solar system on Colorado’s Fort Lupton Readiness Center absorbs and converts solar energy, July 2020. The Colorado Department of Public Health and Environment’s Supplemental Environmental Program funded the 150kW Photovoltaic Solar array at the Fort Lupton Readiness Center in Colorado. Electricity generated by the solar panels will offset 100% of the facility needs which makes the Readiness Center Net-Zero electric.



Waste Reduction and Diversion: Over the past two years, the COARNG has focused on both reducing solid waste stream and improving waste management, including medical waste, which has been of particular concern during the global pandemic. A medical waste management plan

was implemented this year across all COARNG units. The Facilities Maintenance directorate is currently evaluating dumpster use throughout the state, revising waste equipment and pickup schedules for maximum efficiency according to results of a new waste audit.

In terms of diversion, the EQ program is working with the USP&FO and Facilities Management Branch to determine the best approach to recycling. Since most recyclables are generated at readiness centers scattered throughout the state, centralized stockpiling and storage for conventional DRMO commodity sales is less than ideal. As an alternative, the EQ program is working with readiness centers to identify local recycling vendors to find cost-effective alternatives that dovetail with existing waste management contracts. An added benefit to this approach will be the associated reduction in trucking and transportation emissions.

Electric Fleet: Indeed, thinking more cohesively about reduction of emissions and vehicle efficiency has been a primary objective of the EQ program over the past two years. Three EQ staff currently sit on the GGLC, taking an active role in shaping new sustainability policy for state agencies and departments. Promotion of electric vehicles is a state priority, and the COARNG has led the way in this area, acquiring five Chevy Bolts and a Ford Fusion Energi (plug-in hybrid) electric vehicles over 2019-2020 to replace fuel inefficient Jeep Liberty models and one Chevy Impala. The Chevy Bolts based at JFHQ allow Environmental staff to reach 19 COARNG facilities based on round trip mileage starting with a full charge. Eight more state electric vehicles are planned to be acquired between FY21 and FY23. A five-year plan has been implemented to support transition to include 12% battery electric and 18% plug-in hybrid vehicles in the state and GSA fleets by 2026.

At issue for the COARNG was determining how to obtain and administer the charging stations these vehicles would require given statutes regulating the use of state versus federal funds and revenue generation. While researching state policies last year, the EQ staff found there were no comprehensive state guidelines or policies available to assist decision makers and action officers to avoid unexpected consequences while developing an electric vehicle/electric vehicle supply equipment (EV/EVSE) initiative. Also, existing agreements with state agencies and Charge Point though the ChargePoint Master Services and Subscription Agreement did not comply with state statute. In 2020, the EQ program created a working group within the GGLC to create guidance for the implementation of the state's EV/EVSE initiative per the 2019 executive order, with Program Manager Mike Speth named chair of the group. Through the working group, the COARNG was able to update guidance for EVSE installation contracts, grants available, construction funds, and maintenance and subscriber costs. They also completed a legal review for contracts with ChargePoint Master Services subscription agreements and designed training for vehicle



Chief Warrant Officer 2 Kyle Benedict, State Fleet Manager in the G4 office, recharges a Government Service Agency leased Chevy Bolt, September 2021. The Colorado Army National Guard is transforming the Federal and State fleets internal combustion engine vehicles to all-electric zero emission vehicles to reduce the carbon footprint of the COARNG.



management and fleet implementation. Through this collaboration, the EQ program successfully resolved the core issue for the COARNG's charging stations this year. They established the protocols to allow for charge backs to the proper fleets to cover operations and maintenance costs for the charging stations and built a billing system for the electricity consumption via fleet payment cards. With these issues resolved, the COARNG has proceeded with construction of the charging stations at six high density GSA and state fleet sites throughout the state, including the MATES, the RTI, Buckley Space Force Base and key readiness centers. Other state agencies facing the same challenge to building EVSE are also now able to pick up the COARNG's solution as well.



EPAS: The COARNG has integrated energy reduction and waste management into the state's EPAS inspection process. This year, the EQ program made the transition from conventional audits to automated, technology-enabled checklists that allow for tailored reviews of each COARNG facility. This year, 80% of audits were completed with the mobile EPAS and checklist program, with tablets submitting data directly to the E3. As a result of this streamlining, call outs from inspections are easily identified, and the reporting process is standardized, rapid, and consistent. The checklists have also allowed maintenance technicians throughout the state to tie energy goals related to specific utility aspects (boilers, electric panels, equipment specifications, etc.) to be reflected in these audits.



Environmental field representative, Joe Bishop, documents an interview during an assessment with Sgt. Samuel Alfano, September 2021. The Colorado environmental assessment team adopted the mobile Installation Corrective Action Plan and assessment tools that are part of Army National Guard's WebCASS database, increasing the efficiency and accuracy of the Environmental Performance Assessment System.

A notable aspect of the COARNG's EQ program is the ways in which all its initiatives tie directly back into the COARNG's mission and operations objectives while also establishing a model that other agencies and military entities are now adopting.

Controlling for energy costs and establishing energy resilience as well as renewable energy sources are paramount to safeguarding the COARNG's operations. The importance of these projects is reflected not only in their integration into the eMS and the prioritization of sustainable practices at every level of the COARNG organization, but also by the TAG's WIGs in conjunction with state executive orders.

The EQ program has been integral in helping to instill an awareness of and commitment to these goals throughout all COARNG facilities and units. All utility information is reported to the E3 in the installation's EnergyCAP database, and custom reports can be retrieved by the facility Energy Monitors and Unit Administrators, with a dashboard view is also available for COARNG Leadership. Expansion of automated metering and database collection of energy and water data has helped to streamline reporting even further. The EQ program emphasizes training users in these database tools to empower facilities managers in using their own data to drive better practices and improvements.



Larger resiliency commitments are reflected in the CFT’s validation of critical facilities and development of a resiliency planning package. The proposals will incorporate solutions to meet 14-day emergency periods, including efficient generators, microgrids, potable water storage, microturbines, and other technologies that will allow the COARNG to function independently of any commercial or municipal systems. Their solution package will be a model for other states to follow.

The COARNG’s investments in electric vehicles are another project where readiness and innovation intersect. Already, the COARNG has created the blueprint for other state agencies to adopt, but their costing solution will benefit every state Guard facing similar walls between state and federal funding.

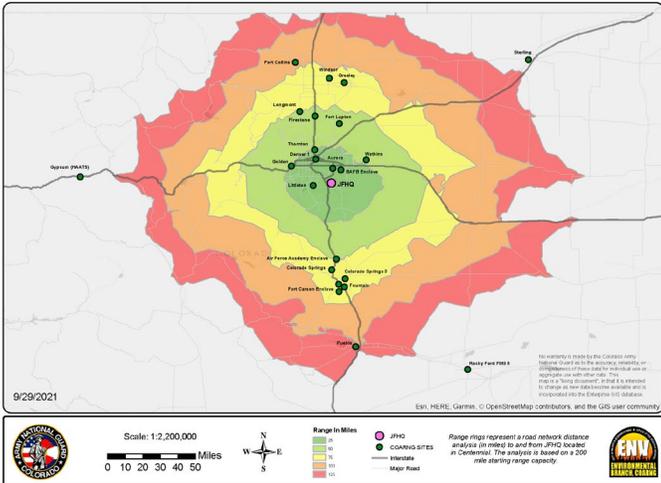
The scale of the COARNG’s fleet, both state and GSA vehicles, has led state legislators to prioritize charging infrastructure and EV conversion funds for the Colorado Military Department; by 2026, projections suggest that a total of 50 state and federal vehicles can be using charging stations. The COARNG was also asked by NREL to join NGB in participating in the Federal EV Round Table, presenting their expertise on working with state agencies, implementing cost-sharing structures, and installing the infrastructure. In this capacity, the COARNG is clearly leading the way not only among the military, but throughout the federal government. From a mission standpoint, the COARNG is also creating the infrastructure now that anticipates the eventual introduction of tactical EV vehicles and equipment, ensuring that their units will always be at the forefront of training.

Yet another new project for the EQ program

with wide-ranging benefits is the cyber accreditation process for facility automation in partnership with Schneider Electric. The introduction of automated systems has been a great advantage for energy cost reductions, allowing for remote control of HVAC, lighting, and other facility systems in ways that avoid usage surges and monitor for system malfunction. These systems, however, must be cyber secure to ensure that they cannot be digitally hijacked or attacked with ransomware. The COARNG is developing the risk management protocols and cyber compliance checks to safeguard these systems through the accreditation process; other states and military agencies will then be free to use those security systems via the DoD network.

The EQ program has been uniquely effective in sharing expertise and communicating best practices to local stakeholders and partners. Their role on the GGLC and associated working groups, including the EV working group, has had lasting impact for the state, resolving the key impediments that had blocked EV adoption. COARNG staff have assisted other agencies develop best practices for energy and environmental stewardship in other areas as well. They

COARNG CHEVY BOLT ELECTRIC CAR RANGE



The Range Map graphic illustrates the distance an electric vehicle can safely travel and return to home station before running out of fuel, June 2020. Range anxiety is a barrier to transitioning users from the comfort of internal combustion engine vehicles to all-electric battery Zero Emission Vehicles (ZEV), the Range Map helps drivers prepare trips in one of the COARNG’s ZEV.





assisted Colorado DOT to develop a solar garden that will employ a subscription model to construct solar PV that agencies can buy into with maintenance managed by a utility industry partner; this project just completed a second-round request for proposals with a winner selected to move forward with the project execution. EQ staff helped Colorado Department of Health and Environment in the review and selection of their Small Business Ombudsman and Green Government Representative. Currently, they are assisting the state Energy Efficiency Committee to revise the Executive Order that will amplify statewide EV infrastructure based on the lead of the COARNG's GSA fleet needs. They have contributed to three different county resilience plans and the State's overall resilience plan. EQ staff also serve on the EPA Region 8 Interagency working group steering committee and on the project prioritization committee for National Defense Center for Energy and Environment, helping to select projects for authorization and funding. In every regard, the EQ program's collaboration and support across these organizations have firmly established the COARNG as the leading force for long-term, comprehensive approaches to sustainability throughout the state and the military.