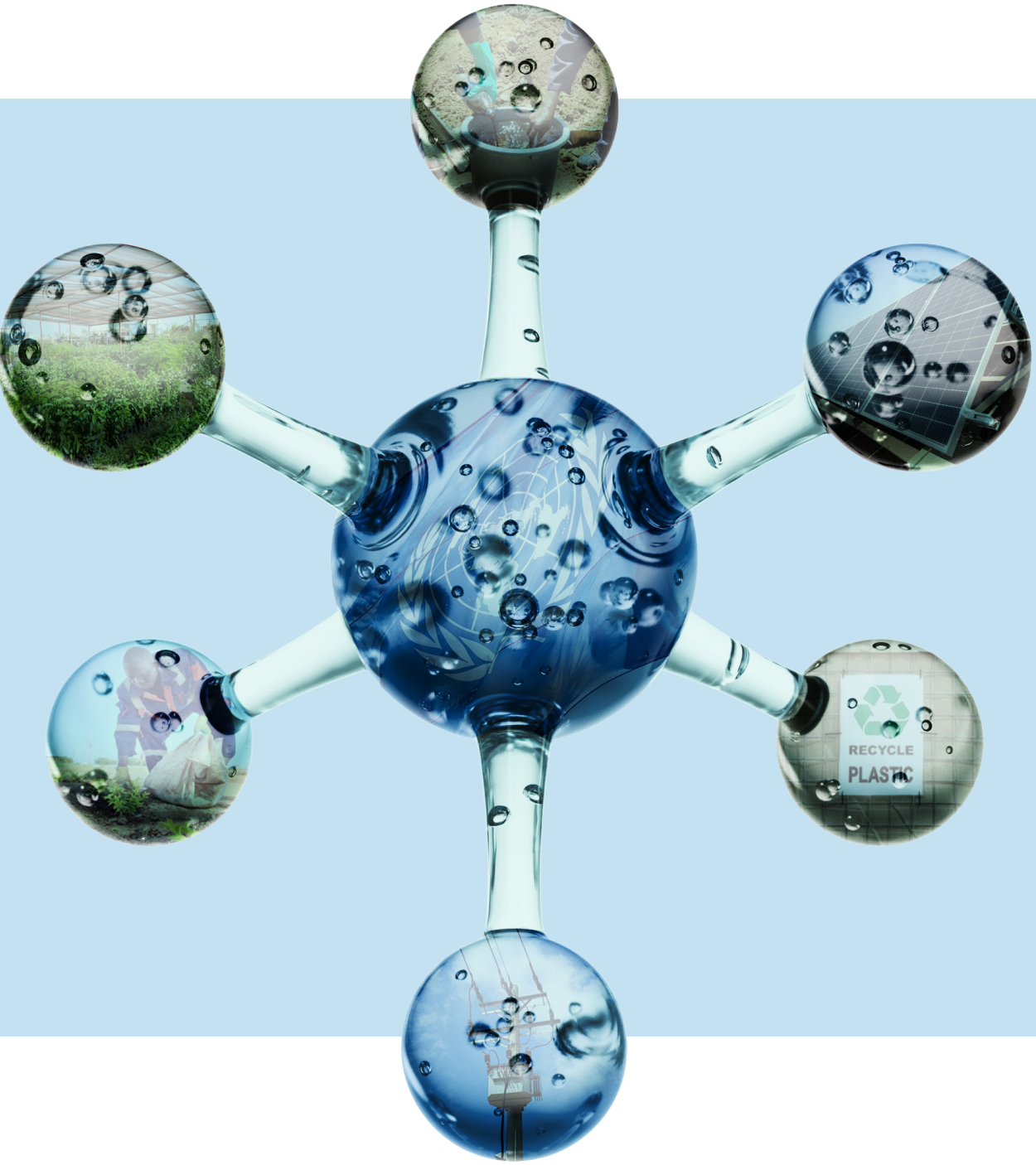
# Environmental Good Practice

DEPARTMENT OF OPERATIONAL SUPPORT



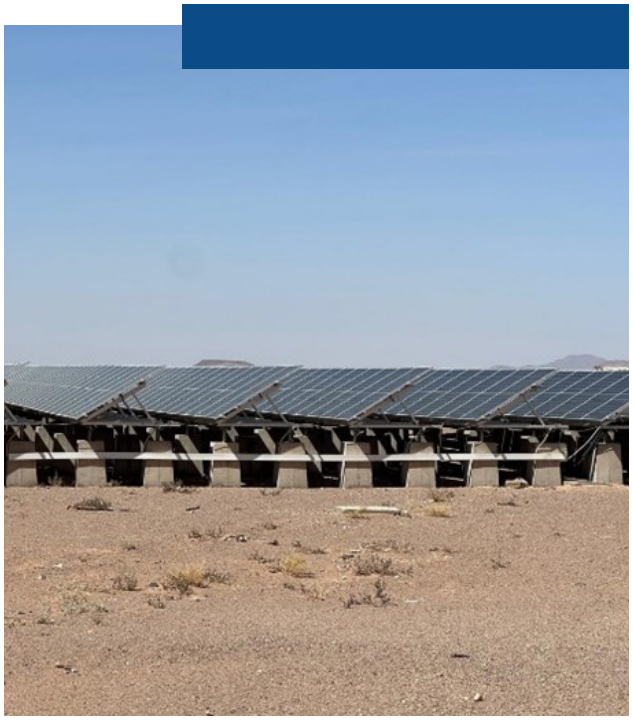

2025

## Annual Collection of Case Studies from Field Missions

Stories collected from 2024

# Energy

## MINURSO Expands Solar PV-Hybrid Systems Throughout the Mission



As part of its multi-year plan to transition to cleaner energy sources, MINURSO has expanded the deployment of hybrid solar-diesel power systems to additional remote locations in fiscal year (FY) 2023-2024. Following successful commissioning and testing, these systems now include 150kWp units at team site Awsard (upgraded from 100kWp), 150kWp units at team site Smara, and 100kWp units at team sites Oum Dreyga, Bir Lahlou and Mijek. This brings to a total of six sites out of nine fully operational on solar power in the mission.

MINURSO is committed to expanding solar installations in other remote areas and progressively phasing out traditional diesel generators in the coming years. These solar systems provide a reliable, clean source of electricity; significantly reducing dependence on diesel generators and minimizing the logistical and security challenges of fuel delivery to isolated locations. Once the necessary monitoring infrastructure is fully operational, MINURSO expects measurable reductions in fuel consumption, energy use, and overall carbon emissions.

# UNFICYP's Substitution Plan for Air Conditioners

In Cyprus, UNFICYP has embarked on a long-term project of replacing old air conditioning units using R410 gas with new modern units using the R32 environmentally friendly refrigerant. Currently, approximately 1,100 air conditioning units in the mission use the old type of R410 gas. During the last three years, the mission has managed to replace over 320 units with new environmentally friendly air conditioning units.

In addition to eliminating the use of harmful ozone-depleting refrigerant gas, the introduction of high-efficiency models resulting in energy savings between 5 - 7%. These modern units lead to a more comfortable indoor environment with consistent temperatures and improved air quality at lower electricity cost and reduced carbon footprint. Not only does it enhance living conditions, but it also aligns with the mission's goal to promote energy conservation and environmental stewardship, benefiting UN peacekeepers, local communities, and the planet.

# UNTSO Sees the Benefit of Solar Systems and Plans for More Installations


UNTSO's solar installations have truly been a game-changer, demonstrating the power of renewable energy at four key locations (Observation Posts 56, 72, 71, and Camp Faouar on the B-side). The installations have significantly reduced UNTSO's reliance on fuel generators, cutting fuel consumption by an impressive 65% with 93 kWp installed in 2023 and early 2024. Building on this success, UNTSO will expand hybrid solar systems to the remaining 8 Observation Posts (21.5 kWp each) by the end of 2025. This is expected to raise the mission's total renewable energy capacity to 172 kWp, increasing the share of renewable energy used by the mission from 8 to 20% with projected annual savings of 200,000 litres of fuel and 495 tons of CO2 equivalent.

Additionally, UNTSO will work with DOS, through extra-budgetary funding provided by Germany, to install a 50-kWp solar system at ISMAC House in Damascus, Syria; which is expected to further raise the renewable energy share of the mission to around 25%. This ambitious plan reflects a deep commitment to Environment, Social and Governance principles, driving UNTSO toward a greener future.

# UNIFIL Conducts a Renewable Energy Opportunity Study

In Lebanon, UNIFIL conducted a renewable energy opportunity study which offered a preliminary overview of potential energy upgrade projects across eleven camps connected to a contingent owned equipment (COE) power grid, as the sole power source. These projects could be implemented by troop contributing countries (TCCs) to enhance energy performance and contribute to the mission's efforts in reducing its environmental footprint. Given the lack of renewable energy grid infrastructure in Lebanon and the existing legislative gaps that hinder the establishment of power purchase contracts with energy service providers, UNIFIL's primary strategy for increasing renewable energy integration will focus on on-site renewable energy projects.

Due to Lebanon's abundant sunlight, solar photovoltaic (PV) systems are considered the most suitable option. In addition, they are the most widely adopted renewable energy technology in UN Peace Operations due to their low maintenance requirements, scalability, and low levelized cost of energy over a project lifespan of over 10 years. Based on the actual load at the sites and the available area for PV panel installation, most proposed solutions involve integrating a low/medium penetration hybrid system that combines solar PV with existing diesel generators for optimal fuel consumption. The study indicated that the cost of the proposed systems ranges from $30,000 to $500,000, with a payback period of 2 to 4 years. If all proposed projects are implemented, the estimated cost will be 3.5 million USD, resulting in 5,200 tons of avoided CO2 emissions and 2,084,246 litres of annual fuel savings.

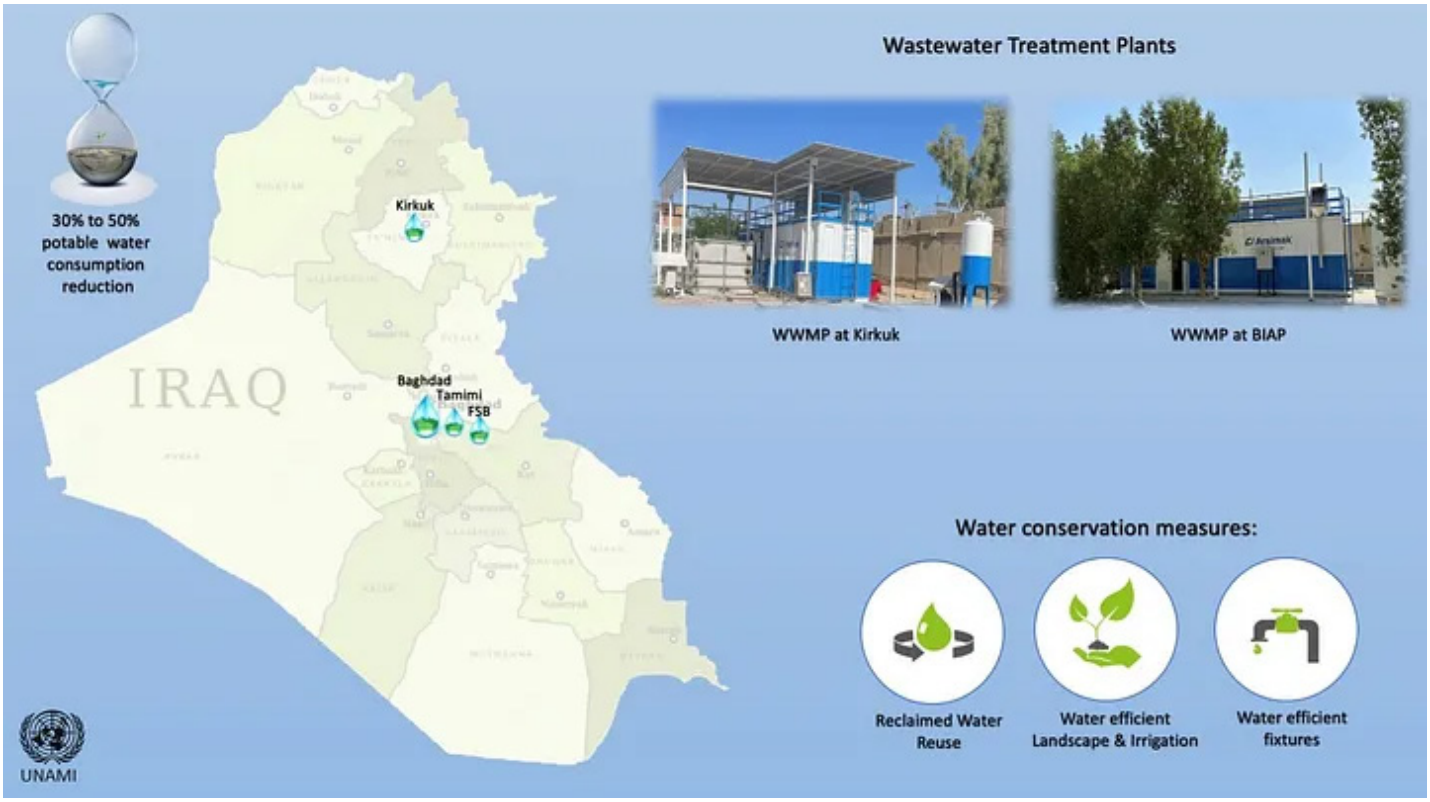
# Nepal and the US Partner to Build a Large Renewable Energy System in UNMISS

With technical assistance provided by the UN, which included data collection, a scoping study, a preliminary engineering design, a bill of quantity, and technical specifications, Nepal and the US have partnered together to build a 185 kWp solar PV system in the Nepali Battalion 1 camp in Rumbek, South Sudan. The largest COE renewable energy system installed to date in UN Peace Operations, the low penetration solar PV hybrid plant, which became fully operational in February 2025, is expected to reduce the amount of diesel generators used by the unit to generate electricity by over 100,000 litres per year (with a corresponding greenhouse gas emission reduction of about 270 tons CO2 eq per year). An energy storage system will be added to the plant in 2025. This project represents an innovative bilateral partnership between a top troop and/or police contributing country (T/PCC) and a Member State, with technical support provided by the UN, resulting in a significant contribution to improving operational resilience, while reducing noise emissions in the camp alongside reducing the environmental footprint of the Nepali infantry battalion and UNMISS.

# Water & Wastewater

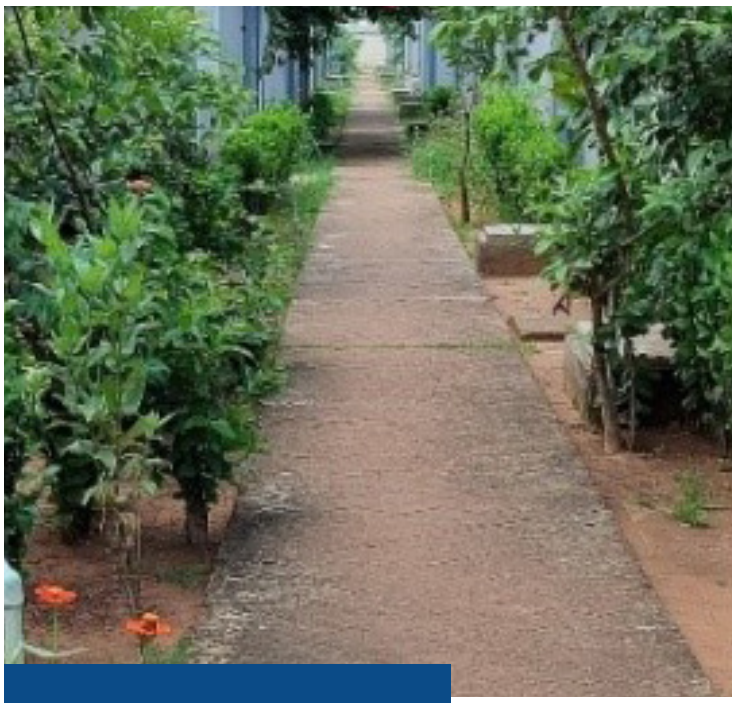
## UNAMI Optimizes its Water Management Strategy Amid the Water Crisis in Iraq

Iraq faces a severe water crisis as freshwater resources decline due to climate change, population growth, and inefficient water management. Once reliant on the Tigris and Euphrates Rivers, the country now contends with reduced water levels and widespread pollution, threatening sustainability and stability. In response, UNAMI has implemented a comprehensive strategy within its operations to address freshwater scarcity in the region. This approach focuses on eliminating freshwater use for outdoor applications, while enhancing efficiency in indoor water consumption. In partnership with UNICEF, UNAMI has upgraded wastewater treatment systems across all its locations with state-of-the-art technologies, obtaining a treated wastewater effluent with suitable quality for its reuse in irrigation and other technical purposes.



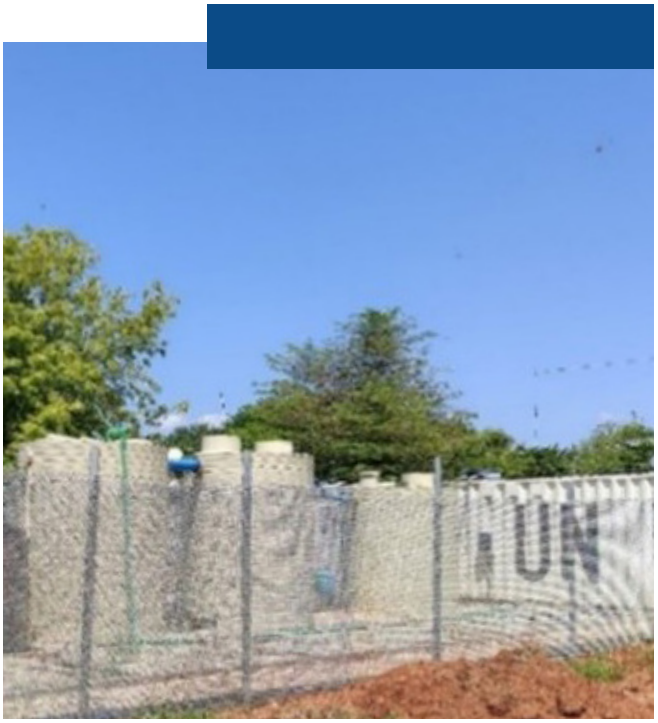
In terms of water efficiency systems, UNAMI has implemented drip irrigation networks and low-flow water fixtures for indoor use, resulting in an impressive 40% reduction in freshwater consumption. By addressing both outdoor and indoor water demands, UNAMI offers a forward-thinking model of sustainable water management, tailored to meet the challenges of a resource-scarce future. UNAMI's innovative and collaborative efforts serve as a blueprint for tackling water scarcity, providing a replicable model for sustainable practices in regions facing similar challenges worldwide.

# Wastewater Reuse for Gardening in UNMISS



In South Sudan, the UNMISS Torit field office has implemented a system where wastewater coming from 161 accommodations is collected, treated, and reused for garden watering. On average, about 770 m3 per month of treated wastewater was reused for irrigation of trees and garden plants in MSA-1, MSA-2, MSA-3 and in the green belt. A section of land between the helipad and the fuel tank has been designated as a green belt since 2019.

A biodiversity garden was implemented in the green belt to further green the camp and use recycled wastewater to irrigate a variety of crops. Trees native to the Torit area were planted in this space which is reserved exclusively for green space, ensuring no future construction or habitat disruption. Reusing treated wastewater for crop irrigation is an environmental best practice as it helps prevent groundwater depletion. This initiative significantly reduces water consumption and promotes sustainable water management.



# UNSOS Handover of Boreholes and Dry Toilets to the Host Government

Since June 2023, UNSOS has been reducing its footprint in Somalia. To date, 18 Forward Operating Bases (FOBs) have been handed over to the host government. This included the handover of 12 boreholes, having a total yield of 150,000 litres per hour. Together with the boreholes, EURO MEC water treatment plants, ODIS water treatment plants with solar panels, and generators were handed over, along with six-month worth of consumables and spare parts. UNSOS conducted basic training on operation and level 1 maintenance, based on manufacturers' recommendations for generators, water treatment plants, and solar panels. Five sessions were conducted for 64 participants, as part of hands-on training for the operation and maintenance of the handed over equipment. Further, UNSOS has conducted 2 training sessions for trainers (TOTs) of ATMIS troops, to enable them to install and commission dry toilets. To date, seventy dry toilets and 50 barrels have been installed in various FOBs. This will go a long way in ensuring that the host government meets Sustainable Development Goal (SDG) six, which aims to ensure the availability and sustainable management of water and sanitation for all.

# UNGSC Celebrates World Water Day 2024


“Water for Peace”, the theme for this year’s World Water Day, called for the transformation of water from a source of conflict into a source of cooperation. At the UN’s Global Service Centre (UNGSC), this vision was integrated in environmental work in the field, promoting sustainable use of water sources and wastewater management to minimize pollution risk. Beyond the technical support provided to field missions, UNGSC engaged in outreach with the host communities, with a view to inspiring the next generation.

To mark this important day, UNGSC Brindisi welcomed 130 high school students for a World Water Day Ceremony, following hands-on exposure to the work of and activities led by the center’s environmental experts. Throughout these diverse initiatives, students deepened their understanding of this critical resource and explored ways to support the realization of SDG 6: Water and Sanitation for all by 2030, noting “We must not look the other way. All of us can take steps to advance access to water for all.”

Scan this QR code for the full story!

# Solid Waste

## Recycling of Aluminum and Tin Cans in MINUSCA

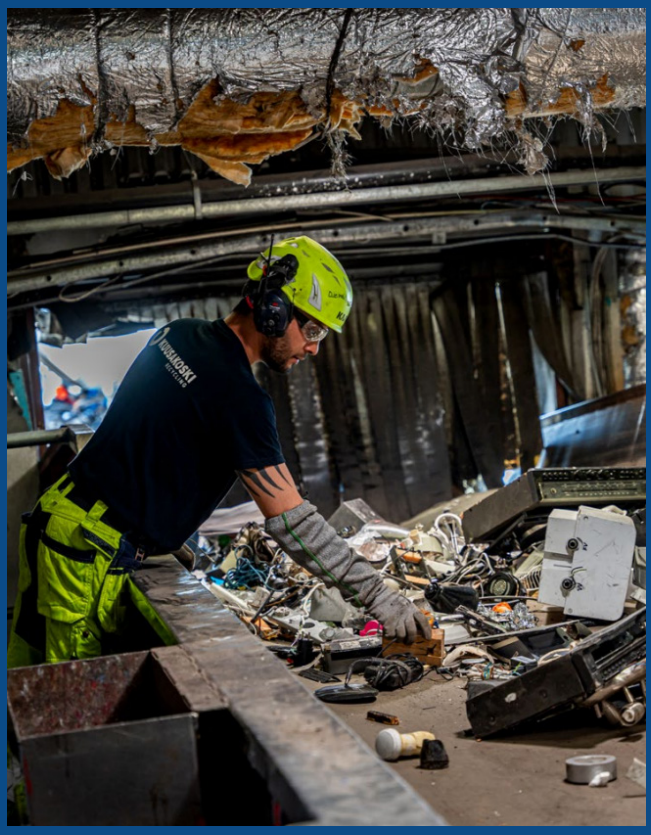
To enhance waste management and recycling efficiency within both civilian and military camps, MINUSCA established a systematic programme featuring coloured waste bins for effective segregation in 13 of its 14 sectors. These bins, designated in five distinct colours, assist in sorting waste and minimizing landfill volume. A well-defined collection schedule is in place and has been communicated to all camp managers and logistics officers to ensure strict adherence. Metal waste, including aluminium and tin cans, is specifically collected every Thursday. Following collection, these recyclable materials are transported to the M'Poko waste processing station in Bangui where a secondary segregation process is conducted to remove any contaminants such as plastics and glass bottles (similar processes are being conducted in Bria and Bouar).


After secondary sorting, the clean metal is compacted using a baler/compactor to facilitate easier handling. Shredding is not needed in this case as the baler/compactor significantly reduces the volume of the materials and the recyclables are purchased based on weight. The compacted metal is then sent to the Property Disposal Unit (PDU) for disposal through established scrap metal contracts. The PDU has secured an agreement with a company that purchases metal at a rate of 20 XAF per kilogram. To date, 90,000 kilograms of cans have been delivered to the PDU, generating an income of XAF 1,800,000 (about 2,700 USD) for MINUSCA. An additional 54,000 kilograms of metal waste is scheduled for delivery to the PDU, further contributing to the program's financial and environmental goals.

# MONUSCO Conducts Onsite Bioremediation During South Kivu Site closure

In 2024, MONUSCO closed 32 locations in South Kivu over a six-month period. Hydrocarbon soil contamination was one of the issues encountered during the environmental clean-up activities in most of the closing sites. Whereas historically the recommendation would have been to excavate and transfer the contaminated soil to the PDU for disposal, MONUSCO conducted bioremediation in situ of approximately 150m3 of soil, leaving the closing site free of hydrocarbon contamination.

A joint effort between the contingents and Mission Support Division staff, the bioremediation was implemented using the RemScan™ soil analyzer and the reagent RemActiv™. This was facilitated by training on bioremediation given by the Environmental Protection Unit to the contingents and Mission Support Division personnel (engineering and transport sections) in which over thirty people were trained. The reagent RemActiv™, used as a catalyst and source of nutrients to accelerate the bioremediation process, was made available to all closing locations identified with soil contamination.



# MINUSMA Manages its E-Waste

When MINUSMA entered the downsizing and liquidation phase, the mission faced multiple challenges, including ensuring the responsible management of approximately 18 tons of electronic waste (e-waste). Recognizing the potential human health impacts and environmental and reputational risks associated with improper informal processing and disposal, MINUSMA sought technical solutions compliant with the UN's Environmental Policy for Peacekeeping Operations and Field-based Special Political Missions and established best practices. The mission utilized the new global systems contract for e-waste management (Danoffice IT), which offers formal, specialized end-to-end services for e-waste management. The mission endeavoured to safely transport e-waste from regional hubs (like Gao) to Bamako. The contractor and its logistics partners thereafter executed the necessary arrangements for the collection, transportation, and effective recycling of the materials. MINUSMA personnel initiated the process by safely packing, labelling and loading e-waste, including Printed Circuit Board (PCB), servers, uninterruptible power supply (UPS) among other electronic components, into secured containers.

All items were inventoried to maintain traceability and meet documentation requirements. The two shipments transited through Dakar, before being shipped to a certified recycling facility in Finland. Throughout the process, the contractor managed all logistical tasks, including customs paperwork, regulatory export approvals, and applicable Basel Convention requirements. At the recycling facility, the waste underwent systematic processing. Metals for recycling were recovered and managed separately. Plastics were processed for recycling or energy recovery, while other non-recyclable materials were disposed of safely. This approach greatly minimizes potential environmental and health impacts, and supports resource conservation. This effort demonstrates the importance of proper and effective e-waste management in achieving responsible liquidation.

# Use of Automated Composters in UNMISS and UNISFA

A significant step towards environmental responsibility has been taken by UNMISS and UNISFA with the installation and operation of automated composters. At UNMISS, two automated composters were donated by the UK engineering contingent when it departed the mission and are now being used at Bentiu and Malakal field offices. At UNISFA, multiple automated composters are now installed at Abyei HQ and Dokura Camp with more units recently procured for other field sites. Segregated organic wastes are collected from kitchen canteens and accommodation units and mixed with garden waste such as grass, and leaves, together with woodchips or sawdust, to maintain an optimal carbon-to-nitrogen (C/N) ratio.

The composters have advanced features such as rotators for even mixing, a ripening chamber for optimal crushing, integrated heating elements, and ventilation fans to maintain the required temperatures. These are all controlled via a sophisticated human-machine interface (HMI) and/or control panel ensuring that the composting process is efficient, manageable, and requires minimal manual intervention. These initiatives are part of a broader environmental strategy aimed at reducing food waste and promoting sustainable practices in mission areas. Organic food wastes disposed of at dumpsites can generate greenhouse gases, causing harm to the environment and surrounding communities if improperly managed. The automated composters are designed to convert organic food waste into high-quality compost, a valuable resource that enriches the soil with nutrients, improves soil structure, promotes plant growth, and reduces the mission's environmental footprint.

# Wider Impact & Positive Legacy

## UNVMC Connects to the Energy Grid

**POSITIVE LEGACY:** In Colombia, a UNVMC camp in Colinas has historically been dependent on on-site diesel generators for electricity. Located in a sparsely populated rural region, the camp faced logistical challenges due to poor roads and limited diesel suppliers. To resolve these issues, UNVMC initiated the construction of secondary power lines from the nearest municipal grid to the camp. This will reduce energy costs, lower greenhouse gas emissions, and ensure a more reliable power supply. Additionally, the project enabled the connection of the neighbouring local population and the police station to the new power lines, contributing a positive legacy lasting beyond the camp closure.

# UNISFA-Pakistan Contingent Conducts a Cleaning Drive and Tree Planting Programme in Goli Camp

**WIDER IMPACT:** As part of its ongoing peacekeeping and environmental initiatives, the UNISFA-Pakistan contingent played a pivotal role in the preparations for the celebration of World Environment Day 2024, bringing together the local community in a unified effort to foster harmony and build trust in the region. The contingent, in close partnership with the local community, organized a comprehensive cleaning drive and conducted educational seminars. These efforts not only improved sanitation conditions but also underscored the critical importance of environmental stewardship and the prevention of pollution, contributing to both public health and community well-being. Additionally, the contingent's commitment to sustainability was exemplified through their tree-planting campaign, with 100 trees already planted at the Goli team site. This initiative contributes to the long-term ecological health of the area and demonstrates the mission's dedication to promoting sustainable environmental practices.

# UNAMA Marks World Environment Day 2024

**WIDER IMPACT:** On 5 June 2024, UNAMA commemorated World Environment Day, under the theme "Our Land. Our Future. We are #GenerationRestoration". The event was hosted by UNAMA and featured interventions by the country representatives of UNICEF, UN Women, and UNOPS. During the event, the mission honoured all catering and retail vendors in UNAMA compounds who have played a significant role in the mission's efforts to phase out single-use plastics. UNAMA has successfully eliminated five single-use plastic items across all its compounds in Afghanistan.

The phased-out items include plastic cutlery, crockery, shopping bags, Styrofoam packaging, and bottled water. To ensure a smooth and eco-friendly transition, the following sustainable alternatives were introduced: 1) plastic cutlery and crockery was replaced with durable alternatives such as wooden, porcelain, glass, or stainless-steel options; 2) Styrofoam packaging was substituted with paper-based alternatives; 3) single-use 0.5-liter and 1.5-liter plastic water bottles were replaced by 19-liter refillable water containers and dispensers; and 4) reusable shopping bags are now provided to encourage sustainable consumption practices instead of plastic bags. There was also a range of local plant produce available as snacks, serving to raise awareness about the need to reduce the carbon footprint of imported food and promote sustainability.

# Solar-Powered Water Supply Plant Boosts Residents and Returnees

**WIDER IMPACT:** In Pieri, South Sudan, UNMISS has funded and recently handed over a solar-powered water facility that will benefit some 6,000 households and approximately 37,000 internally displaced persons currently living in the area. This low-cost, big-impact project will ease the considerable burden on women and children, who are habitually tasked with fetching water, and protect them from attacks, including abductions and intercommunal killings. The project was implemented by Impact Actions, a national non-governmental organization, with the hope that the water point will make the reintegration of displaced people easier.

# EMS

## UNSMIL Leverages its Environmental Plans to Reduce its Footprint

UNSMIL is implementing several environmental initiatives based on the waste and energy management plans to promote a cleaner and more sustainable environment. UNSMIL has set up plastic waste collection points within its compound in Tripoli and is encouraging staff members to actively participate in the environmental improvement efforts by sorting plastic waste at its source and disposing it at the designated plastic waste collection points. The collected plastic waste is sent to the municipality plastic waste collection hub for further recycling. In line with the mission's energy management plan, UNSMIL targeted the reduction of its energy consumption by installing solar PV streetlights.

The currently installed system works off-grid successfully. The replacement of 276 streetlights reduces the electricity consumption across the UNSMIL compound by some 650 kWh per night. Considering 8 hours of operation daily, this amounts to reducing the monthly electrical consumption by about 10%. Using renewable energy has helped reduce UNSMIL's carbon footprint and decreased reliance on carbon-based energy sources, thereby lessening the harmful impact on the environment in Tripoli.

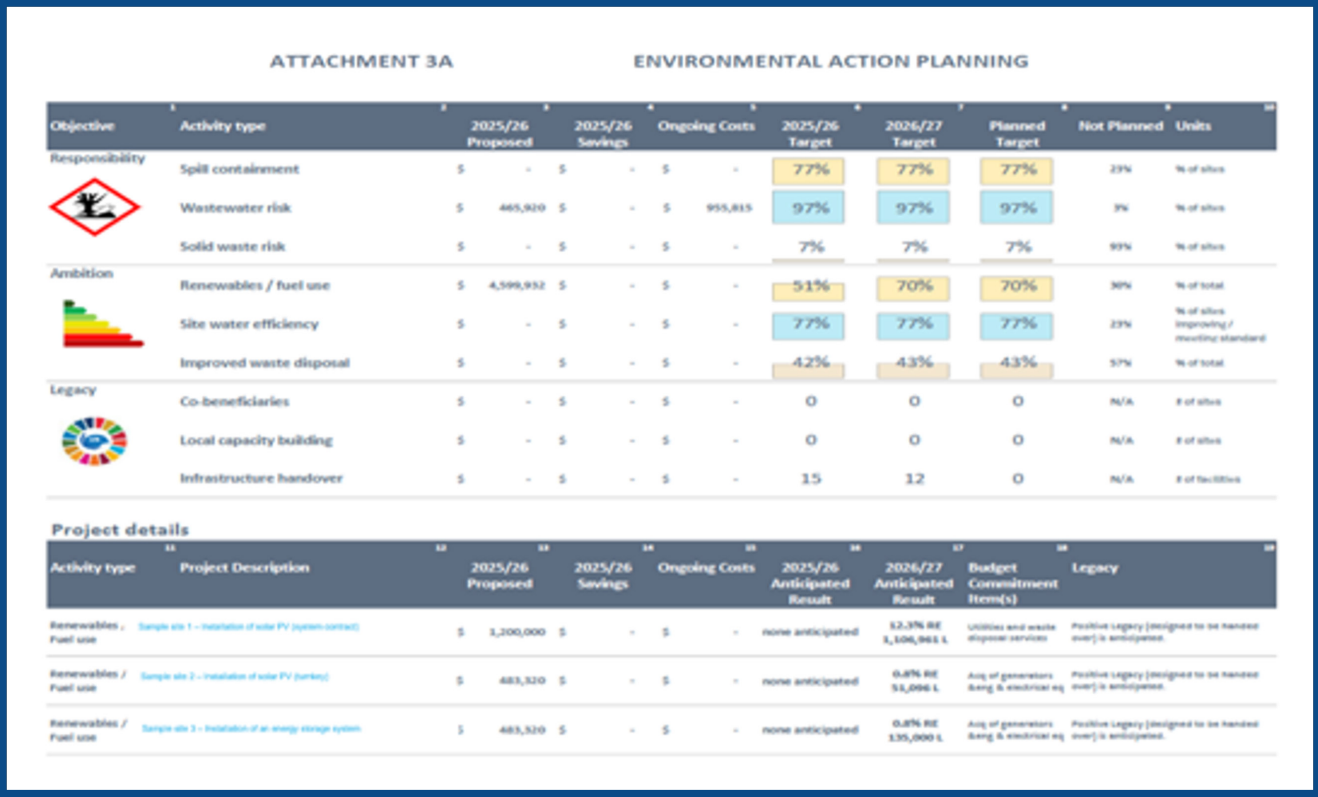
# Training-of-Trainers Workshop to Improve Technical Capacity in the Area of Environmental Management

In October 2024, a five-day training-of-trainers (ToT) workshop was held at the United Nations Mission in South Sudan (UNMISS) through extra-budgetary funding from Italy. Twenty-nine participants from eight peacekeeping and field-based special political missions, including engineers, technicians, contractors, and environmental officers, took part in the workshop led by the UN Global Service Centre's Environmental Technical Support Unit (ETSU) and the Rapid Environment and Climate Technical Assistance Facility (REACT). The aim of the ToT workshop was to improve the capacity of the participants to operate and maintain waste management equipment, and to build a broader understanding of effective integrated waste management, including the exploration of opportunities to leave a positive legacy for host communities. The ToT included practical demonstrations of equipment available from the global systems contract, such as twin-chamber incinerators equipped with auto feeders and pollution control systems, portable barrel incinerators, shredders and glass pulverizers. Participants further discussed how to best disseminate the lessons learned across their respective missions and outlined the types of training they plan to conduct with ETSU/REACT's support. As a next step, these ideas will be developed into a specific training schedule.

# UNMISS Conducts Environmental Screening for New Temporary Operating Bases

As required by mission policies, all new construction projects undergo an environmental screening. When necessary, this might include a full Environmental Impact Assessment (EIA). This process helps integrate environmental considerations into project plans, ensuring that potential environmental risks are identified and mitigated before any new construction begins. This process played a key role in assessing the different proposed sites for four new Temporary Operating Bases (TOBs), allowing the mission to choose suitable locations while rejecting those with high environmental risks, such as flooding, potential difficulty with managing wastewater, and/or the presence of biodiversity (swamp/wetland).

The environmental screening exercise also informs various mitigation measures to reduce hazards and risks by the presence of a new TOB, such as solid waste mitigation measures or the type of ablutions best suited to reduce wastewater risks. By integrating environmental considerations early on, the screening helped prevent potential damage, preserve natural resources, and enhance staff safety. This aligns with the mission's commitment to sustainability and environmental protection.



ATTACHMENT 3A ENVIRONMENTAL ACTION PLANNING

| Objective | Activity type | 2025/26 Proposed | 2025/26 Savings | Ongoing Costs | 2025/26 Target | 2026/27 Target | Planned Target | Not Planned | Units |
|---|---|---|---|---|---|---|---|---|---|
| Responsibility | Spill containment | $ - | $ - | $ - | 77% | 77% | 77% | 23% | % of sites |
| | Wastewater risk | $ 465,920 | $ - | $ 955,815 | 97% | 97% | 97% | 3% | % of sites |
| | Solid waste risk | $ - | $ - | $ - | 7% | 7% | 7% | 93% | % of sites |
| Ambition | Renewables / fuel use | $ 4,599,932 | $ - | $ - | 51% | 70% | 70% | 30% | % of total |
| | Site water efficiency | $ - | $ - | $ - | 77% | 77% | 77% | 23% | % of sites improving / meeting standard |
| | Improved waste disposal | $ - | $ - | $ - | 42% | 43% | 43% | 57% | % of total |
| Legacy | Co-beneficiaries | $ - | $ - | $ - | 0 | 0 | 0 | N/A | # of sites |
| | Local capacity building | $ - | $ - | $ - | 0 | 0 | 0 | N/A | # of sites |
| | Infrastructure handover | $ - | $ - | $ - | 15 | 12 | 0 | N/A | # of facilities |

Project details

| Activity type | Project Description | 2025/26 Proposed | 2025/26 Savings | Ongoing Costs | 2025/26 Anticipated Result | 2026/27 Anticipated Result | Budget Commitment Item(s) | Legacy |
|---|---|---|---|---|---|---|---|---|
| Renewables / Fuel use | Sample site 1 – Installation of solar PV (system contract) | $ 1,200,000 | $ - | $ - | none anticipated | 12.3% RE 1,106,941 L | Utilities and waste disposal services | Positive Legacy (designed to be handed over) is anticipated. |
| Renewables / Fuel use | Sample site 2 – Installation of solar PV (turnkey) | $ 483,320 | $ - | $ - | none anticipated | 0.8% RE 51,096 L | Acq of generators &eng & electrical eq | Positive Legacy (designed to be handed over) is anticipated. |
| Renewables / Fuel use | Sample site 3 – Installation of an energy storage system | $ 483,320 | $ - | $ - | none anticipated | 0.8% RE 135,000 L | Acq of generators &eng & electrical eq | Positive Legacy (designed to be handed over) is anticipated. |

# New Environmental Target Setting Framework Rolled Out Across Missions

The environmental performance target setting framework is one of the key initiatives introduced through the Way Forward: Environment Strategy for Peace Operations 2030. After being piloted with MINUSCA and UNISFA last year, the target setting framework has been rolled out across peacekeeping missions in the context of the 2025/2026 budget preparation cycle. Leveraging existing mission multi-year energy, waste, and wastewater management plans, the target setting framework is a mission-led and bottom-up process which aims at providing an indication to Member States of the impact on performance that may be expected based on projects submitted in the budget.

For the budgetary committees, this new approach is showcased through an upgraded supplementary information sheet included in the mission budget proposal. With this new sheet, relevant committees and Member States will now be provided greater clarity on expected environmental performance improvements from projects in the area of energy, water and wastewater, solid waste management and related facilities and infrastructure plans, across several years.

**For more information, please send an e-mail to dos-ousg-envs@un.org or visit operationalsupport.un.org/en/environment**

Environmental Good Practice:
Annual Collection of Case Studies from Field Missions

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