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REPORT

POWERING AHEAD:

The United Nations and Somalia's Renewable Energy Opportunity

By Abdi Aynte and Eugene Chen with David Mozersky

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The Powering Peace Initiative

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COVER NECSOM Power Plant, Garowe, Puntland State of Somalia
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ABOUT POWERING PEACE

Powering Peace is a joint research initiative of the Stimson Center and Energy Peace Partners, which aims to explore cleaner and more efficient energy options for multinational field operations in fragile states. The Stimson Center, a Washington, D.C.-based research and policy center, has led studies and research on peace operations since its founding more than 30 years ago, and works to protect people, preserve the planet, and promote security and prosperity. Energy Peace Partners is a U.S.-based organization that works to leverage climate and finance solutions to support peace in places affected by violent conflict.

The Powering Peace initiative envisions a broad policy shift within the United Nations (UN) system and among its member states to adopt renewable energy in field operations for both short-term and long-term benefits. As part of a shorter-term effort, the initiative aims to help the UN embrace more efficient and cost-saving technologies, and shift to greater use of renewable energy in support of missions. That is more urgent now within the context of the UN Secretariat's 10-year Climate Action Plan to source 80 percent of electricity from renewable energy by 2030. The initiative also seeks to identify impacts of and improvements in current practice, such as reducing the expense or insecurity associated with long fuel convoys or corruption. As part of a longer-term effort, the initiative aims to help the UN better integrate climate solutions in crisis-affected areas as part of the way it does business, an effort that can support peacebuilding and fulfill the organization's ambition to achieve universal global access to energy under the UN's Sustainable Development Goals.

Powering Peace examines the extent to which the footprints of international humanitarian and peace operations can be leveraged to introduce and extend the benefits of renewable energy to communities in fragile states. The project includes the use of reports and case studies as a research tool to identify innovative practices, incentives, and disincentives facing field missions, as well as opportunities for greater efficiency and peacebuilding. Our first report, *Renewable Energy and UN Peacekeeping: Untapped Potential in the Democratic Republic of the Congo*, was published in September 2019. Our second report, *Shifting Power: Transitioning to Renewable Energy in United Nations Peace Operations*, was published in January 2021. Our third report, *From Renewable Energy to Peacebuilding in Mali: MINUSMA's Opportunity to Bridge the Gap*, was published in June 2021. Powering Peace is now undertaking a series of case studies of energy use by UN missions in conflict-affected countries.

Powering Peace is funded through the generous support of the Schmidt Family Foundation/11th Hour Project and the Carnegie Corporation of New York. The project has also benefited from an anonymous donor, and the expert assistance of the Loomis Council at the Stimson Center. Powering Peace is led by David Mozersky and Sherwin Das of Energy Peace Partners, and Andrew Hyde, Alex Hopkins, and Victoria Holt of the Stimson Center.

ABOUT THIS REPORT

This report presents the research findings of a dedicated Somalia case study that examines how Somalia's energy sector is linked to the broader conflict dynamics in the country as well as the existing energy practices of the UN. Out of these two lines of inquiry, the report considers what can be learned from the energy practices of the UN and African Union (AU) operations in Somalia, informed by an analysis of what is unique to Somalia and what can potentially be replicated in other countries where UN peace operations are deployed. The study seeks to understand how the UN's transition to renewables can be accelerated and also implemented in a way that supports peace and development in local communities. The report was prepared on the basis of a literature review and semi-structured interviews, conducted from August through October 2021, with officials of the Federal Government of Somalia, the government of Southwest State, executives of major electricity service providers in Somalia, representatives of Kube Energy, and UN staff in New York, Mogadishu, and Addis Ababa. In addition to the key findings, the report also makes several recommendations aimed at discrete communities of stakeholders, including the UN Secretariat, UN member states, the Federal Government of Somalia, the federal member states, and electricity service providers in Somalia.

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EXECUTIVE SUMMARY

Somalia faces challenges that are among the most complex of any country in the world. More than 30 years after the state collapsed, efforts aimed at rebuilding a functioning government system, improving security, and expanding the economy continue to inch ahead in the face of a serious ongoing Al-Shabab insurgency and the growing impacts of climate change. Much of the international community's support for these efforts comes through a joint effort by the United Nations (UN) peace and support missions (UNSOM and UNSOS, respectively), and an African Union (AU) peace operation (AMISOM). Yet there is an opportunity to accelerate one aspect of sustainable peace: expanding access to renewable energy.

This report looks specifically at the major role energy plays in consolidating peace in Somalia. Somalia is among the least electrified countries in the world. According to the World Bank, the share of the population that has access to electricity is only 36 percent, and only 11 percent in rural areas. The country has a completely decentralized energy sector that has largely evolved in the absence of government and regulations, and is made up of dozens of mostly small, hyperlocal, privately owned energy companies, each operating mini-grids to electrify their communities. These are overwhelmingly powered by generators run on imported fossil fuel (diesel) despite the many negative consequences of this approach, including environmental (burning dirty, low-quality diesel); economic (one of the highest electricity costs in the world); and insecurity (al-Shabab controls and taxes nearly all diesel supply chains throughout the country, forming an important revenue source for the insurgency). Renewable energy offers an attractive option to expand new energy access to electricity in the country, and has growing support from both private sector and government backers. While a handful of successful renewable-energy projects have emerged, access to traditional financing poses a significant challenge for the sector and for ambitions around a larger transition to clean energy.

The UN and AU missions play important roles in supporting governance, providing security, and helping move toward a transition to peace and sustainable development. While the specific institutional arrangements are unique to Somalia, the energy practices of the UN are similar to those in other international peace operations in fragile contexts; they are overwhelmingly dependent on diesel generators for power, and represent sizable energy footprints in the areas where they are deployed. Indeed, the UN alone has approximately 65 megawatts (MW) of generator capacity, while Somalia's official energy figures show only 125 MW of total installed electricity generation capacity in the entire country. The UN's dependence on diesel is expensive and detrimental to the environment, and it creates security vulnerabilities for both the UN and the AU. The UN is taking a proactive role toward climate change in Somalia, having introduced the first-ever role of climate security advisor to the UN mission. In addition, the UN system has set ambitious internal renewable-energy and climate targets through two separate initiatives, the UN Secretariat Climate Action Plan (UNSCAP) and Phase 2 of the UN Department of Operational Support (DOS) Environment Strategy for Peace Operations. However, much remains to be done to make progress toward achieving those goals.

Building on these existing policy frameworks and ambitious climate goals, the UN Support Office in Somalia (UNSOS) has entered into a power purchase agreement (PPA) with a commercial renewable-energy company in the town of Baidoa. Although PPAs are common in the private sector, this is the first instance of a UN peace operation entering into this type of arrangement. The PPA allows UNSOS to buy clean energy at a contracted term and price from a solar plant that will be financed and built by a private-sector entity. This commitment from the UN, along with a similar commitment from the local government of Southwest State, provides a way to leverage the UN's considerable purchasing power to support new clean-energy projects coming online while avoiding the challenges associated with the attempt to finance, build, and manage such a project under the UN's existing budget and procurement policies and practices.

The PPA being tested in Baidoa offers a model for consideration in other sites in Somalia, as well as in other UN peace operations. The PPA model presents several notable benefits. First, it offers a way to rapidly scale the UN's use of renewables, offering a viable pathway to meet its ambitious climate goals, including the UNSCAP goal of reaching 80 percent renewable-energy use by 2030. Second, the use of PPAs to leverage new private-sector investment can be scaled for renewable-energy projects across Somalia, helping to overcome a key capacity challenge for the national electrification strategy. Third, by extending the benefits of new energy access from UN missions to local communities, this strategy can support broader peace and development goals: it will reduce diesel tax revenue flowing to Al-Shabab, while supporting the numerous socioeconomic benefits associated with expanded energy access that are aligned with Somali federal and regional development plans.

Key Findings

First, Somalia is one of the least electrified countries in the world, a challenge that inhibits the country's economic potential and sustainable growth. However, the government has the opportunity to expand access to energy, particularly through renewable energy, to support a range of development, security, economic, and climate goals in the country. This is a matter of importance to the UN, including member states and the Secretariat, the Somali government, and the people of Somalia.

Second, Somalia's energy sector is extremely decentralized, and distributed mini-grids offer the most feasible way to rapidly expand energy access. The energy sector comprises mostly small and localized private-sector electricity service providers, who have evolved in the absence of a functioning government or government structures. Diesel-powered, localized mini-grids dominate, with al-Shabab earning revenue from the taxation of diesel supply chains, among other things, all across the country.

Third, renewable energy is feasible, offers numerous benefits to communities, and is drawing increasing interest from electricity service providers. Yet financing challenges are hindering growth, and the ability of the Federal Government and federal member states to help in this regard is limited. Somalia's vibrant private sector has filled many of the gaps in services traditionally provided by government, but the country's still low levels of electrification demonstrate the daunting challenges. Electricity service providers are increasingly interested in transitioning to renewable energy for both economic and environmental reasons, but the lack of a functioning banking sector makes the up-front financing requirements of renewable energy difficult to overcome. While a few promising examples have emerged, these are the exception rather than the rule.

Fourth, the UN/UNSOS can play a role an important role in supporting Somalia's energy transition, but faces institutional challenges of its own. The UN's transition to renewable energy has started and is driven by a number of factors – from practical considerations, such as the need to cut costs and mitigate the security impacts of its current dependence on diesel, to the institutional commitments reflected in the UNSCAP and the DOS Environment Strategy. The UN faces a number of hurdles in implementing this transition in Somalia; while some are unique to Somalia, others are rooted in the organizational culture of the UN. In addition to gaps in resources and expertise, at both the field and headquarters levels, a major challenge is the disconnect between high-level objectives and the work of individuals on the ground. The responsibilities and expected contributions of units and individuals toward these organizational objectives remain undefined, and most of the progress made to date has been the result of efforts by individuals who proactively acted within the scope of their existing responsibilities to reduce the environmental impact of mission operations. If it can find ways to overcome these challenges, the UN can be an important partner and catalyst for new renewable-energy projects across Somalia and in other field missions, an outcome that would advance UN objectives on climate, environment, and peace and security.

Fifth, successful models exist. The Baidoa PPA presents an exciting new model for UN peace operations to partner with private-sector companies to launch new renewable-energy projects, offering a way to benefit UN missions and local communities. The Baidoa PPA between UNSOS and Kube Energy, and separately the memorandum of understanding between Kube Energy and the government of Southwest State, is breaking important new ground for UN peace operations. By engaging as an energy consumer and outsourcing its energy generation to the private sector, UNSOS can mitigate many internal challenges that hinder renewable-energy transitions at scale in field missions. At the same time, this model leverages the considerable purchasing power of UNSOS to make project financing viable for the private-sector partner. The partnership of Kube Energy with the government of Southwest State creates the conditions for the project and expands its benefits well beyond UNSOS to local government and, ultimately, to local communities. This model could be scaled elsewhere in Somalia, and beyond, and the UN should immediately look to expand this model to other locations.

Recommendations

To the United Nations Secretariat:

- **Update Mission Systems.** The Secretariat, supported by the General Assembly and Security Council as appropriate, should take advantage of the transition from AMISOM to the new AU Transitional Mission in Somalia (ATMIS) to complete long-delayed processes, such as the review of contingent-owned equipment and the establishment of the joint environmental committee.
- **Share Knowledge of PPAs.** The Department of Operational Support (DOS) should capture and document the lessons from the ongoing process of operationalizing the Baidoa PPA arrangement – which involves UNSOS, the regional government, and the private sector – and should share this knowledge widely across other peace operations and Secretariat departments.
- **Hire Climate Expertise.** The position of climate security advisor, currently funded through extrabudgetary resources, is a valuable resource that applies a climate lens to both the substantive and support elements of the work of the UN. The post should be regularized in Somalia and introduced in other UN missions.
- **Build Knowledge.** Gaps in capacity at headquarters and the field in areas such as climate security, implementation of renewable-energy systems, and environmental aspects of force generation and contingent-owned equipment should be identified and addressed through requests for additional resources or redeployment of existing resources. Where gaps in expertise are identified, these should be addressed through measures including dedicated recruitment drives or the potential establishment of standby capacities that can be deployed as required to support individual missions and other Secretariat entities in a similar manner to other standby capacities based out of the Global Service Centre in Brindisi, Italy.
- **Monitor Progress**. Climate needs to be seen as an issue that transcends all lines of effort, whether substantive or support. In the Somalia context, a senior-level joint environmental committee that includes AMISOM should be established as a matter of priority, and one of its key responsibilities should be to monitor the implementation of the mission environmental action plan.[1]
- **Stop Making Dielse the Default.** For mission support planning, diesel generators should no longer be the default option for producing electricity. As part of a broader portfolio of alternatives, long-term standby arrangements should be explored with private-sector companies for renewable-energy projects. Because it is

more difficult for troop- and police-contributing countries to adjust how they generate power than it is for the UN Secretariat to do so, mission support planning should shift as much of the responsibility to missions as is feasible.

- **Calculate Full Costs.** Climate security considerations need to be factored into military planning and force generation processes. Contingent-owned equipment and memorandum of understanding management review boards need to be proactive about challenging operational requirements for diesel generators and other fuel-consuming major equipment and communicating this information to headquarters to inform negotiations and amendments.
- **Expand Private-Public Partnerships.** The Support Partnerships Service within the DOS at headquarters should adapt its triangular partnership program to include renewable energy. It should also actively engage with the private sector and with donor countries that provide training and equipment support to troop- and police-contributing countries to encourage a shift away from reliance on diesel by contingents.
- **Review Electricity Options.** To better guide missions and other entities toward renewable-energy solutions, the existing arrangements at headquarters for the planning, sourcing, and acquisition of electricity should be reviewed. This review should also examine the existing portfolio of available systems contracts and ensure that contracts are also available to meet installation, maintenance, and disposal requirements.

To the General Assembly:

- **Meet UN Climate Targets – UNSCAP.** In addition to supporting the recommendations proposed for the Secretariat, the General Assembly should hold the Secretariat and its entities accountable for meeting UNSCAP targets and for requesting information on progress to date, challenges faced, and plans to meet the targets.

To the Working Group on Contingent-Owned Equipment (COE):

- **Review Generator Standards.** The 2023 Working Group on COE should consider reviewing standards for generators provided as major equipment, including the possibility of requiring fuel flow or kilowatt-hour (kWh) meters to inform regular contingent reporting on kWh consumed and carbon dioxide footprint. As an alternative, the working group can consider introducing an approach to the reimbursement of fuel-consuming major equipment in which equipment that is operational, but without functioning odometers or fuel meters, receives a lower rate of reimbursement than equipment that allows for the monitoring of fuel consumption.
- **Reconsider Existing Equipment Categories.** The working group should also consider merging the electrical equipment category of self-sustainment into the accommodation category, as contingents also deploy generators for self-sustainment requirements under the category of electrical equipment, and such capacity is primarily for meeting the electricity requirements of camps.
- **Reinforce Accountability.** In addition, the working group should establish that contingents should be accountable for the fuel that they receive from the UN, including for how the fuel is distributed, used, managed, and stored.

To the Federal Government of Somalia (FGS):

- **Strengthen Capacity at the MEWR.** The FGS should continue to strengthen the technical capacity of the Ministry of Energy and Water Resources (MEWR) so that it can effectively regulate and provide oversight on the energy sector, especially electricity service providers (ESPs).
- **Harmonize Energy Policies.** The FGS should strive to harmonize its energy policies with those of federal member states with a view toward creating a stronger collaborative framework between the two, and enabling the standardization of both the quality and prices of energy in Somalia.
- **Incentivize Clean Energy.** The FGS should allocate adequate resources to help the energy sector overcome prohibitive financing challenges and leapfrog toward renewable energy. The FGS should promote clean energy and regain its oversight and policy-setting role. Incentives could include tax forgiveness to spur on direct foreign investment and import of renewable-energy material into Somalia.
- **Promote Public-Private Partnerships.** The FGS should promote public-private partnerships and provide legal support to foreign investors to help them navigate federal and state regulations, and to mobilize additional resources for the energy sector.
- **Empower the Directorate of Environment.** The FGS should transform the Directorate of Environment, currently at the Office of the Prime Minister, into a full-fledged ministry that has the political and legal clout as well as the resources to meaningfully lead on national environmental policies and strategies.
- **Create Annual Renewable-Energy Targets.** The FGS should set annual renewable-energy targets as well as annual price ranges for ESPs, and empower federal agencies to hold ESPs accountable to those targets. In doing so, the FGS would set clear benchmarks for ESPs and protect consumers from price hikes.
- **Prioritize Safety through Clear Standards.** Putting safety at the center of policymaking, the FGS should set clear standards that compel ESPs to share electric distribution networks and wiring of consumer houses to reduce the number of fires related to poor wiring. Similarly, the FGS should set standards for fuel imported into the country.
- **Develop Skilled, Local Labor through Training.** The FGS should establish technical and vocational education training (TVET) centers dedicated to the energy sector with the objective of creating a local skilled labor force that can support the sector. These centers should prioritize renewable energy.
- **Increase Public Awareness.** The FGS should launch a national public awareness campaign aimed at educating citizens about the severity of climate change and ways they can contribute to reducing the impact of climate change.

To the Federal Member States:

- **Establish Utilities Commissions.** Member states should establish state utilities commissions that can regulate and provide oversight to ESPs. These commissions should cooperate closely with the MEWR on policy alignment and strategy.

- **Set Standards and Prices.** Member states should cooperate with the FGS on setting clear standards and a price range for fuel and electricity, ensuring that the safety of citizens is paramount in all policies, while promoting overall access to clean electricity.
- **Provide Incentives.** Member states should promote renewable energy by providing catalytic resources to ESPs that meet federal and state targets. State incentives could include the provision of land for solar plants and wind farms, and agreed taxation frameworks to allow predictability for project investments.
- **Offer Training.** Member states should establish TVET centers to train the next generation of workers who can contribute to the growth of the renewable-energy sector.

To Electricity Service Providers (ESPs):

- **Integrate Networks.** ESPs should integrate their electric distribution networks in order to minimize duplication and maximize output. Parallel distribution networks are extremely inefficient and pose a safety hazard to citizens.
- **Pivot to Renewables.** ESPs should gradually reduce reliance on diesel generators and leapfrog to the use of solar photovoltaics, wind turbines, and other renewable-energy sources. These alternatives have proven to be both commercially viable and environmentally sustainable.
- **Collaborate on Regulations.** ESPs should collaborate closely with federal and state regulatory authorities for a common objective, which is to provide clean, safe, and affordable energy to Somalia's citizens.
- **Invest in Training.** ESPs should invest in local TVET programs that can train highly skilled labor for the energy sector.
- **Provide Customer Incentives.** ESPs should incentivize renewable energy to their customers by offering discounts and other perks that attract more customers and raise awareness.

1. INTRODUCTION

Somalia has been in various stages of conflict for 30 years. International involvement has ebbed and flowed, including multiple United Nations (UN) peacekeeping missions in the 1990s and both direct and indirect interventions from neighboring countries, the wider region, and the broader international community. Much of the international intervention in recent years has focused on counterterrorism and combatting offshore piracy. A new federal government was established in 2011, which survives despite a contested electoral process, an evolving conflict against the al-Shabab insurgency, and unresolved disputes between the federal and regional governments. Somalia's complicated politics are also reflected in the constellation of international missions deployed in the country to support peace, including an African Union (AU) peace support operation, a UN special political mission, and a UN logistical support office.

Somalia remains among the most fragile states in the world, and is among the most challenging for international peace operations. The effects of decades of conflict can be seen across the country's development indicators and are exacerbated by the impacts of climate change. Somalia is also among the least electrified countries in the world: only about 36 percent of the population has access to electricity according to the World Bank.[2] Most of the energy use in the country comes from generators running on imported diesel or from burning charcoal and other biomass. The AU and UN missions in the country also rely on diesel generators. Yet the UN in Somalia is showing leadership in pioneering new approaches on climate security and energy that can assist their operations, support peace and development goals, and serve as a model for other UN peace operations in the field.

One notable effect of the decades of conflict in Somalia is the minimal role of government in the electricity sector and the provision of other essential social goods and services. The private sector has stepped in to provide most services, including in sectors generally considered in most countries to be public services, such as energy, education, and health care. With no state-owned utility company, Somalia's energy sector is made up of dozens of mostly small, hyperlocal, privately owned companies, each running their own – mostly diesel-powered – mini-grids. Like other commodities, diesel supply chains pass through al-Shabab checkpoints throughout the country, providing an important revenue stream for the group and showing a direct link between the energy sector and the war economy.[3] Yet localized mini-grids will remain the reality in Somalia for the foreseeable future, and efforts to further electrify the country will build on the existing mini-grid model. There is growing adoption of renewable-energy systems in Somalia due in part to increasingly attractive economics, but financing represents a significant challenge to further growth. Given the size and scale of the UN and AU missions, the envisioned energy transitions of these operations can play an important and catalytic role in facilitating the country's own transition to renewable sources of energy.

The links between conflict, climate change, and energy in Somalia are increasingly recognized and have led to new policies and practices that aim to assess and address the resulting challenges. For instance, the UN and AU missions were the first to include climate-specific language in their mandates, with the UN Assistance Mission in Somalia (UNSOM) subsequently establishing and staffing a position explicitly dedicated to climate security. Concurrently, ambitious renewable-energy and UN climate goals have been set, respectively, in the UN Department of Operational Support (DOS) Environment Strategy for Peace Operations[4] and the UN Secretariat Climate Action Plan (UNSCAP).[5] Notably, the latter sets renewable-energy targets of 40 percent by 2025 and 80 percent by 2030 for the Secretariat's electricity, which includes UN peace operations.[6]

For the UN to achieve these goals, peace operations must rapidly and dramatically shift their energy practices by adopting new replicable and scalable approaches that integrate renewable-energy solutions as well as

UN Under-Secretary-General for Operational Support, Atul Khare, inspects a facility at the AMISOM Mission Headquarters in Mogadishu. *UN Photo/Fardowsa Hussein*

enhance the usage of energy-efficient technologies. The new power purchase agreement (PPA) signed by the UN Support Office for Somalia (UNSOS) and Kube Energy in Baidoa is breaking new ground for UN peace operations, demonstrating an innovative model that leverages the energy footprint and purchasing power of the UN to support new local clean-energy development. If successfully operationalized, this arrangement can unlock short- and long-term gains for peace operations, governments, and local communities. While PPAs can potentially be signed to transition other UNSOS sites in Somalia and be replicated in other UN peace operations, it is important to understand, capture, and share lessons learned from the ongoing process of operationalizing the Baidoa agreement.

It should be noted that, in recent months, political developments in Somalia and in the broader Horn of Africa region, particularly Ethiopia, have led to uncertainty regarding the future mandate, configuration, and composition of the AU and UN presences in Somalia. Even so, the observations in this report related to the energy-related practices of the AU Mission in Somalia (AMISOM) and the UN in Somalia will continue to be valid as long as there are international or regional peace operations deployed in the country that are supported by the UN. In fact, the transition from AMISOM to the new AU Transitional Mission in Somalia (ATMIS) may provide an opportunity to jumpstart several stalled initiatives and review how the energy requirements of the UN and AU can be met in Somalia.

2. A HISTORY OF CONFLICT AND INTERNATIONAL INTERVENTION

Somalia is a country of approximately 16 million people,[7] of whom 60 percent are members of nomadic and agropastoral communities living in rural areas. As a result of the collapse of the state infrastructure that previously supported livelihoods, poverty is very high. Nearly half of the population is food-insecure, and unemployment hovers at around 70 percent, even including the informal economy. The per capita gross domestic product is estimated to be around $335, and about 1.5 million Somalis are internally displaced as a result of various conflicts and natural calamities.[8]

The Republic of Somalia was established on July 1, 1960, from the merger of two newly independent territories, the former British Somaliland and the former Italian-administered Trust Territory of Somaliland. Leaders of the new nation sought to establish a Greater Somalia that would encompass areas that are currently part of Ethiopia, Kenya, and Djibouti. This vision of uniting all ethnic Somalis in the Horn of Africa never came to fruition, but its pursuit – including unsuccessful wars with Kenya and Ethiopia over their respective Somali regions – shaped the political dynamics of the region for decades.

At the time of its independence, Somalia became the first country in Africa to establish a multiparty democracy when authoritarian dictatorship was the norm in post-colonial Africa. The country's first president, Aden Abdulle Osman, was the first African leader to oversee a peaceful democratic transfer of power after losing a free and fair election to Abdirashid Ali Sharmarke. That path-breaking system of governance was celebrated in the West, but was frowned upon by the Soviet Union, which maintained considerable influence in the country.[9] However, western powers did not do much to buttress Somalia's nascent and fragile democracy, while the Soviet Union actively trained the country's top military brass and its technocratic elite, who came to embrace communism as their preferred form of governance.

Sharmarke was assassinated on October 15, 1969. A week later, the military took over the country in a bloodless coup. Under the leadership of General Mohamed Siad Barre, the Soviet-trained head of the Somali Army, the military suspended the constitution, dismantled the Parliament and other democratic institutions, and outlawed political parties and the free press. Overnight, the country became an authoritarian state under the thumb of the military, which would rule for the next 21 years. Somalia has been trapped in a vicious cycle of protracted conflict and incidents of mass violence ever since.

Civil War and Disintegration

Siad Barre's brutal dictatorship ultimately led to the disintegration of the country and the outbreak of a full blown civil war in 1991. In mid-1991, the northern part of the country corresponding to the former British protectorate declared its independence as the Republic of Somaliland. Although no nation has recognized Somaliland's unilateral secession, it continues to thrive as a peaceful and largely democratic entity with an autonomous parliament, judiciary, and security services. The rest of Somalia quickly splintered, as various clans and subclans established localized administrations across the country, becoming the most comprehensively failed state in the world.[10]

As Somalia disintegrated along clan and regional lines, internecine violence raged in virtually all parts of the country. As a result, millions of people were internally displaced, and many others lost their livelihoods. The early civil war decimated the livelihoods of nomadic people, which represent the majority of the population. Many streamed into major towns in search of food and water. By early 1992, severe food shortages affected most of the country, triggering a devastating famine that claimed the lives of some 220,000 people.[11]

United Nations and U.S. Interventions

In April 1992, the UN Security Council established a peacekeeping mission in Somalia to monitor a cease-fire and assist humanitarian relief efforts. However, intense fighting among various warlords impeded humanitarian operations, prompting the United States to offer to lead a separate multinational force to secure the delivery of aid. In December, the Security Council authorized the deployment of such a force – which largely consisted of U.S. troops deployed as Operation Restore Hope – with a mandate to facilitate the delivery of humanitarian assistance.[12] Fighting between U.S. forces and the well-armed militia of General Mohamed Farah Aidid, the most powerful warlord in Somalia at the time, culminated in the Battle of Mogadishu in October 1993, which resulted in the deaths of 18 American soldiers and hundreds of Somali militias and civilians (these events were later captured in the film Black Hawk Down). As a result, U.S. President Bill Clinton ordered the withdrawal of all U.S. troops from Somalia. The withdrawal of U.S. troops was completed in March 1994, and the UN peacekeeping mission withdrew a year later, in March 1995.

Between 1994 and 2000, Somalia was among the most lawless places on earth. There was no functioning central government anywhere in the country, except Somaliland. Over a dozen reconciliation attempts by neighboring countries were attempted during this period, without success. Warlords controlled clan fiefdoms across the country, and the nation's basic infrastructure was comprehensively destroyed. In the northeast, Puntland declared itself an autonomous state in 1998. This new state includes the entirety of two of Somalia's 18 prewar provinces, as well as parts of three other provinces, making it the largest administrative unit under the nominal control of the federal government.[13]

Reestablishment of Central Government

Following months of reconciliation among clans and other political actors, a Transitional National Government was formed in 2000. It would become the first government to be recognized by the UN and most of the international community since the civil war. However, the Transitional National Government struggled to assert its authority beyond a few districts in the capital Mogadishu. Warlords dominated the country and much of Mogadishu. The terrorist attacks of September 11, 2001, triggered a renewed interest in Somalia among western powers, principally the United States.

Instead of backing the legitimate but weak Transitional National Government, Washington opted to support certain warlords in Somalia as part of its global war on terrorism. With the backing of U.S. intelligence agencies, Somalia's disparate warlords came together under the Alliance for Restoration of Peace and Counterterrorism, which was created to help the U.S. war on terror in Somalia.[14] But the alliance had the exact opposite effect: its establishment energized and galvanized Islamist movements in Somalia and spurred the formation of the Islamic Courts Union, a loose coalition of clan courts in Mogadishu. Previously, these courts focused on adjudicating civil and criminal cases brought to them by clan members; in some cases, they kept the peace in their respective neighborhoods. But under assault by the alliance, the Islamic Courts Union – which was very popular among Mogadishu residents – mobilized thousands of troops. By June 2006, the union controlled all of Mogadishu, as well as most of southern and central Somalia.

One of the key members of the Islamic Courts Union was a militant group called al Shabab. The U.S. and other countries in the region, such as Ethiopia and Kenya, became deeply concerned about the group's growing influence. To thwart al-Shabab's meteoric rise, an estimated 30,000 Ethiopian troops crossed into Somalia on December 24, 2006, and occupied the entire southern flank of the country, including Mogadishu. Ethiopia's action, which killed thousands of people and displaced more than 1 million people in Mogadishu alone, served to galvanize the Somali public, which viewed Ethiopia as a historic enemy, to resist the Ethiopian incursion. Al-

Shabab successfully tapped into the popular anger against Ethiopia and became the face of a popular insurgency against Ethiopian occupation. This allowed it to draw considerable financial support from Somalis all over the world and gain thousands of recruits.

AMISOM Deployment

Two months after the Ethiopian invasion, the UN Security Council authorized the deployment of the AU Peacekeeping Mission in Somalia, known as AMISOM,[15] which subsumed and replaced an Intergovernmental Authority on Development (IGAD) mission authorized earlier in December 2006.[16] The first contingent of AMISOM forces arrived in Mogadishu in March 2007 with a mandate to support the fledgling Transitional Federal Government under the leadership of President Abdullahi Yusuf Ahmed, a veteran army colonel and a former warlord.[17]

Although an original purpose of AMISOM was to facilitate the departure of Ethiopian troops, Ethiopia maintained its occupation of Mogadishu and much of southern Somalia until January 2009, when it withdrew its troops from Somalia, due in large part to negotiations conducted by the political wing of the Islamic Courts Union, headed by its moderate leader, Sharif Sheikh Ahmed. Sharif was elected president of the Transitional Federal Government in January 2009, leading a new government of national unity. It was hoped that the election of Sharif, a moderate Islamist, would end the al-Shabab insurgency. However, al-Shabab intensified its attacks against both the Transitional Federal Government and AMISOM, a campaign of asymmetric warfare that continues to this day, nearly 15 years after AMISOM was first deployed. Shortcomings in logistical capabilities on the part of AMISOM troop-contributing countries prompted the UN Security Council to authorize, also in January 2009, the establishment of a logistical support package funded through UN-assessed contributions, to be delivered by a new UN Support Office for AMISOM.[18]

In 2012, Somalia adopted a new provisional constitution and elected the first non-transitional government since the civil war, under the leadership of President Hassan Sheikh Mohamud. The new constitution called for the federalization of Somalia, leading to the establishment of four new federal member states, in addition to the pre-existing Puntland.[19] In federal Somalia, states are largely autonomous and are responsible for their own political, security, and economic affairs, including energy policy. Power is generated and consumed at the local level with little or no oversight by federal and even state authorities.

In February 2022, the Somali government and the AU agreed to redefine the mandate of the African Union peacekeeping mission in Somalia and change its name from AMISOM to the African Union Transition Mission in Somalia (ATMIS). Designed to be an interim mission with an entirely new 'concept of operations', ATMIS is supposed to focus on supporting the government on the implementation of the Somali Transition Plan (STP), an ambitious strategy to expedite the withdrawal of African peacekeepers from Somalia.[20]

Environmental Challenges

According to the Somali government's National Environmental Policy, Somalia is one of the least environmentally sustainable places on earth because of systemic deforestation, as charcoal remains a main source of energy for Somalis in both rural and urban areas. Even after UN Security Council resolution 2036 (2012) banned the export of charcoal from Somalia, the problem persists in the country. "The key environmental challenges that the country faces relate to the nexus of environmental degradation with the collapse of state and governance structures in its many dimensions," notes the National Environment Policy, which further states: "Due to decades of conflict, there is a limited scientific knowledge and research specific to the environment of Somalia. However, the damage that has been done to the environment is visible to the naked eye. The collapse of the State and governance structures have negatively impacted the Somali environment."[21]

Unlike many countries in the world, Somalia has neither a dedicated ministry nor a national parastatal agency responsible for environmental policies. Instead, the coordination of environmental policy and strategy is performed by a relatively small directorate within the Office of the Prime Minister, which lacks the political weight and administrative influence of a ministry. As a result, "environmental issues are treated as an afterthought problem that poses no risk to the country," according to a former official of the Office of the Prime Minister.[22] The former official added that the Directorate of Environment not only lacks the political stature it deserves, but also lacks the necessary budget to operate optimally. For that reason, the directorate relies heavily on donor programs and projects to support its activities.[23]

With no state-owned utility company, Somalia's energy sector is made up of dozens of mostly small, hyperlocal, privately owned companies, each running their own – mostly diesel-powered – mini-grids.

The new National Environmental Policy puts sustainable management of natural resources at the heart of the government's strategy on reducing greenhouse gas emissions for the next five years (2021-2026). Among other things, the government aims to rebuild capacity for environmental governance, including robust regulatory and oversight institutions, as well as to strengthen the partnership between the federal government and federal member states.[24] Crucially, the new strategy also aims to raise public awareness about the extent of environmental degradation and its impacts on the livelihoods of rural and agropastoral communities.

The strategy recognizes that climate change, which further exacerbates environmental degradation, is a major contributing factor to cyclical floods and droughts in Somali that often trigger famine.[25] A recent UN report noted that over the last 30 years, recurrent droughts and floods have become more intense, frequent, and unpredictable, and that these are linked to climate change.[26] Since 2020, flooding has displaced nearly 1 million people in different parts of the country. Environmental officials attribute this vicious cycle to the lack of resilience mechanisms and the collapse of infrastructure.

In its revised nationally determined contribution[27] submitted in 2020, Somalia articulated two broad objectives: (1) increasing resilience to the impacts of climate change, and (2) reducing carbon emissions and making development more resilient. To achieve its stated objectives, the government emphasized the need for multidimensional institutional capacity-building and institutional strengthening to integrate both climate-change adaptation and mitigation into political economics.

3. SOMALIA'S ENERGY SECTOR: UNEVEN GROWTH IN A CHALLENGING ENVIRONMENT

The energy sector in Somalia is characterized by total privatization and deep fragmentation. With the collapse of the state and its energy sector in 1991, power generation became the business of local entrepreneurs in each city and town, which supply electricity at exorbitant prices. The absence of state and federal oversight means that the energy sector has grown unevenly across the country over the past three decades. While urban centers enjoy a relatively better supply of electricity, rural areas are almost entirely deprived of access to power. This uneven growth goes back to the early days of the republic.

Immediately after the military coup in 1969, the new junta nationalized virtually all private companies in Somalia, including electricity companies. Although the country lacked a national grid, there were several energy companies providing electricity to the residents of Mogadishu and a few other urban centers. The military junta created the Ente Nazionale Energia Elettric (ENEE), which became the country's only entity responsible for the generation and distribution of electricity. The Ministry of Energy and Water Resources (MEWR) was designated as the primary policy organ within the central government on energy issues. Together, they controlled all aspects of energy generation and consumption.[28]

When the military dictatorship was overthrown in 1991, the ENEE was barely generating electricity in the capital, Mogadishu, let alone in other regions. Documents from that era show that the ENEE's total generation capacity was only about 20 megawatts (MW), with the majority generated and consumed in Mogadishu. Power cuts were very frequent, and nearly all businesses in the country used their own diesel generators to light their premises.[29]

Current Capacity

Although reliable figures are elusive because of the deeply decentralized and privatized nature of the energy sector in Somalia, independent assessments as well as official accounts estimate the currently installed generation capacity at about 120 MW, with about a half a million electricity connections across the country.[30] As a result, only roughly 36 percent of the total population and 11 percent of the rural population have access to electricity, making Somalia one of the least electrified countries in the world.[31] Approximately 84 percent of the existing supply comes through high-speed diesel-generators, with only 10 percent from renewable energy (mainly solar). The remaining 6 percent comes from power stored in batteries, according to the Federal Government of Somalia's Power Master Plan. According to an energy ministry official, the high-speed diesel generators in use frequently operate well outside their expected and designed performance criteria. This kind of operation results in significant amounts of "wet stacking [which] results in greater wear within engines, higher fuel consumption, pollution, reduced power output, more unexpected downtimes and longer scheduled overhauls."[32]

The Federal Government of Somalia forecasts that, by 2027, the country's aggregate generation capacity will reach 700 MW. Under what it describes as its "transformation scenario," the government aims to further increase its capacity to 4,600 MW by 2037.[33] This scenario would require substantial investment in the energy sector and optimized allocation of funding at both the federal and state levels, as well as building the requisite infrastructure. MEWR officials are cautiously optimistic about the target, but they are circumspect about the current investment trends, which are not encouraging. In its 2020 federal budget, the government did not allocate any resources to the energy sector beyond the running cost of MEWR and other state organs.[34]

The MEWR's Limited Political Influence

The misalignment between the Federal Government of Somalia's ambitious targets in the energy sector and its own lack of investment speaks to the true ownership of these lofty strategies. Nearly all strategies were financed and pushed through by international development partners, with the World Bank as principal actor. Former officials at the MEWR grudgingly concede that key documents were written by external actors with a predefined frame of reference and assumptions about how Somalia's energy sector should look in the near future, without giving due consideration to the structural problems inhibiting the ministry.

The inability of the MEWR to assert its policy and oversight role is due in large part to its real and perceived political influence in the country, which is linked to a complex set of factors such as the level of attention it receives from federal leadership and the clan affiliation of its ministers. Among the 26 federal line ministries, the MEWR is widely seen as one of the weakest in political and economic terms. This arbitrary classification renders the ministry politically impotent and economically impoverished.

In Somalia, the perceived importance of ministries is measured in large part on each minister's clan identity. In Somalia's complex clan power-sharing system, known as 4.5, nearly all ministers appointed to the energy ministry over the past 20 years have hailed from traditionally nondominant clans.[35] This reality has had an adverse effect on the ministry's political influence within the government. A former MEWR official described this pattern as "a deliberate ghettoization of the ministry with serious consequences."[36]

One consequence of this marginalization is the reduced political weight and influence of the ministry within the wider sector and, crucially, among the country's electricity service providers (ESPs), which are almost entirely controlled by dominant clans. In Somalia, almost everything is viewed through the prism of clan identity, which is inextricably linked to political and socioeconomic power. People who hail from dominant clans are generally able to draw on robust social capital that comes with substantial economic and political influence. Given that many of the senior officials at the MEWR hail from the same nondominant clans as successive ministers, their ability to hold powerful ESPs to account is constrained. Furthermore, the MEWR has limited technical capacity to oversee ESPs, as fewer than half a dozen staff possess a technical understanding of the energy sector.[37]

These power dynamics are animating the ministry's posture toward the energy sector as well as its strategic positioning. Until Somalia reforms its governance system in a way that dilutes the role of clans and empowers statutory agencies, it is difficult to imagine that inherently weak ministries such as the MEWR would be able to effectively regulate ESPs.

Electricity Service Providers

Since the collapse of the central government more than 30 years ago, the energy sector has once again been privatized. Today, virtually all energy generation is handled by private companies in different parts of the country, and almost all cities have their own ESPs. Many of the larger cities – such as Mogadishu, Hargeisa, Kismaayo, and Bossaso – have multiple ESPs. These rely primarily on diesel generators to generate electricity for localized grids, which is then sold to consumers at a very high rate. According to the Power Master Plan – the Federal Government of Somalia's main strategy – ESPs "are private enterprises, each of which are vertically integrated autonomous parallel electricity providers. Each ESP owns and operates their complete generation-distribution-customer and revenue chain using a 'radial distribution island network.'"[38]

The ministries of energy at the federal and state levels are, in theory, responsible for setting policies and procedures for ESPs. The Parliament is currently considering legislation aimed at strengthening the oversight

role of the government in the energy sector. Once the new Parliament is in place, expected sometime this spring, it will likely continue debating the legislation, which is also drawing interest and lobbying efforts from electricity companies. In a new policy adopted in 2018, the Federal Government of Somalia, through the MEWR, requires all ESPs to register with the government and obtain proper licenses. In Mogadishu – the only city fully controlled by the Federal Government – the local ESPs have all obtained the necessary licenses and generally cooperate with the ministry. In practice, however, ESPs are essentially independent and rarely report their activities to the ministry, according to a senior ministry official, due to the ministry's low oversight capacity and lack of political weight.[1] A World Bank report concluded that the "energy sector management [of the ministry] is poorly staffed."[39] In other states, local energy ministries or designated agencies act as regulatory authorities, although they also face similar capacity constraints.

Somalia is one of the least environmentally sustainable places on earth because of systemic deforestation, as charcoal remains a main source of energy for Somalis in both rural and urban areas.

Somalia's Power Master Plan recognizes the regulatory and oversight challenges relating to ESPs. As the plan indicates, "[a]ll of the ESPs operate independently and, as a consequence, there is significant duplication of generation, distribution, technical, maintenance and human capability infrastructure. This duplication severely limits the scaling up of electricity generation and even more, hampers delivery and servicing for larger customer loads."[40] As a result of poor regulations and lack of meaningful oversight, about 50 percent of electricity generated by ESPs is lost "within the urban island radial distribution networks" because the companies do not share distribution lines. Another major challenge is the lack of standardization of energy provision at both federal and state levels. For example, there are no standards for wiring consumer houses or businesses, leading to widespread fires. By one estimate, about 60 percent of all urban fires are triggered by faulty electric wiring.[41]

Cost of Electricity

Somalia has one of the most expensive electricity rates in the world. According to the World Bank's Regulatory Indicators for Sustainable Energy report, Somalia ranks in the top 5 percent globally in terms of energy cost, and the top 15 percent in expenditure on power as a share of gross national income per household.[42] Although the cost of electricity is declining as generation capacity and renewable-energy sources increase, most residents of medium to small cities across the country pay an average of $0.80 to $1.00 per kilowatt hour (kWh).[43]

In major urban centers such as Mogadishu and Hargeisa, the average cost per kWh is $0.40 at a retail level and about $0.30 at a wholesale level (i.e., for entities consuming more than 500 kWh per month).[44] By comparison, neighboring Ethiopia sells its electricity to households at $0.06 per kWh, and Kenya sells at $0.15.[45] Somali officials highlight that neighboring countries have had functioning central governments over the past 30 years, which Somalia has lacked, and that these countries have made substantial investments in the energy sector. A key difference is the source of generation; whereas Somalia relies primarily on diesel generators operated by ESP-run mini-grids, neighboring countries tend to have national grids and to generate their electricity from large power stations or hydroelectric facilities, as in Ethiopia.

Major electricity companies across the country are under tremendous public pressure to reduce the cost of energy, and many are responding to that pressure. In a recent meeting with federal officials, power companies committed to bringing down the price of electricity to an average of $0.25 per kWh in the next three to five years.[46] They requested financial support from the federal government, which is unlikely to be able to provide capital investments in that time frame given its meager resources. The energy companies have also committed to increasing the percentage of electricity generated through renewable sources. For ESPs, cheaper electricity means more customers and greater profit margins. However, neither the Federal Government of Somalia nor state authorities have set prices or renewable-energy targets for energy companies. This allows ESPs to sidestep government oversight and continue to charge higher rates, even as generation prices have dropped.

When challenged about sky-high energy prices, ESPs point to several factors that contribute to the cost of electricity. First, the security situation in the country remains volatile, especially in the south-central regions where al-Shabab remains active. As a result, transporting diesel from one location to another is a hugely burdensome undertaking that drives up cost. Second, a shortage of skilled labor with the requisite technical capacity forces many ESPs to source expertise from neighboring countries and beyond. Third, the cost of distribution is extremely high, as each ESP must build, operate, and maintain its own distribution network. Fourth, several ESPs admit that they pay double taxes – to both the federal government and to al-Shabab – a practice that is common among Somalia's private sector.[47] Taken together, these factors drive up the cost of electricity. ESPs believe they would be able to lower prices if some of these challenges were addressed by federal and state authorities.

Cost and Quality of Fuel

As most of the electricity in Somalia is generated by diesel generators, the price of diesel is a central element of the energy sector. As of February 2022, the price of diesel was $171 per barrel, and traders expect it to hit $185 by midyear as a result of high demand and weak supply during the COVID-19 pandemic.[48] In states without a seaport, such as Southwest, Hirshabelle, and Galmudug, the average price of diesel is considerably higher because of transportation and security costs. For example, in Baidoa, the interim capital of Southwest State, the price of diesel was approximately $180 per barrel in October 2021. As a result, electricity is substantially more expensive there than in other states – roughly $0.90 per kWh on average, making it one of the most expensive electricity markets in Somalia.

Most of the diesel imported into Somalia comes from the United Arab Emirates. However, a growing percentage comes from Iran through illicit trading networks offering competitive prices.[49] Officials at the Ministry of Oil, which is supposed to oversee the quality and standard of fuel, are aware of illicit fuel networks and are trying to regulate the market. However, their capacity is limited, and the actors involved in illicit trade are well connected to other officials who facilitate that trade through the main ports.[50] Fuel imported into Somalia, other than that procured by UNSOS, generally is of low quality and has high sulfur levels, therefore contributing to greater wear on the engines of cars and generators alike, higher fuel consumption, increased pollution, reduced power output, more frequent unexpected downtimes, and longer scheduled maintenance. It also increases the need to replace generators that are not economical to repair or maintain.[51]

National Grids versus Mini-grids

According to MEWR officials, Somalia never had a full-fledged national grid before the war. The only functioning grid was one that connected the capital to the two farming provinces directly adjacent to Mogadishu – Lower Shabelle to the southwest and Middle Shabelle to the northeast.[52] In its new "Somalia Power Master Plan", the government defines electricity grids as "physical networks interconnecting all the electrical energy between the source generators and the user loads. This grid is classified as the network connecting the electrical infrastructure of a region or country."[53]

As the country recovered from protracted conflicts that destroyed the basic energy infrastructure that existed before the war, municipalities gravitated toward mini-grids. Also known as "island grids," mini-grids across Somalia are typically owned and operated by ESPs. In many cases, larger cities could have more than one mini-grid, which often overlap. The government acknowledges that "this duplication severely limits the scaling up of electricity generation and even more, hampers delivery and servicing for larger customer loads. Duplication is especially acute for ESPs within the cities served by multiple ESPs."[54]

In a deeply fragmented country like Somalia, where responsibility for many areas, including the energy sector, is devolved to the state level, mini-grids have the potential to form the basis for an interconnected national network that can be used to scale up electrification in lieu of a national grid.[55] Mini-grids are also gaining popularity among environmental activists in Somalia who view them as catalysts for sustainable sources of energy in the long term. A former environmental official asserted that national grids are "a thing of the past." He is among a growing chorus of voices calling for the promotion of mini-grids that are connected to a solar plant or wind turbine for every district, given the abundance of sunshine and wind in Somalia.[56] The established consensus among sector experts and key actors appears to be that establishing a national grid is unlikely for Somalia in the foreseeable future, given widespread instability and financial constraints.

Across the country, mini-grids are already the reality. According to MEWR officials, each of the 92 prewar districts has its own primarily diesel-powered mini-grid, owned and operated by a local ESP.

Mini-grids as Catalysts for Renewable Energy

Beyond the policy circles of Mogadishu, mini-grids are widely seen in the sector as holding the key to a renewable-energy future for Somalia. ESPs and environmental activists are advocating for federal- and state-level policies to support mini-grids as catalysts for sustainable energy. The association of power companies in Somalia has been lobbying federal and state authorities to adopt laws that are favorable to mini-grids as sources of renewable energy.[57]

In response, the Federal Government of Somalia is considering a number of policy options to codify mini-grids as catalysts for clean energy. Senior officials at the MEWR hold the strong view that mini-grids hold the key for Somalia to leapfrog to the use of clean energy. Within this context, the government is in discussions with several major donors to secure funding for the sector. Although these discussions are at an early stage, the objective is "to encourage and promote" mini-grids as the most realistic pathway toward renewable energy for Somalia.[58]

In December 2021, the World Bank unveiled the Somalia Electricity Recovery Project, with $150 million in funding – the largest financial commitment ever for Somalia's energy sector. According to the World Bank, the focus of the project is to "increase access to cleaner, lower cost electricity for 1.1 million households, or approximately 7 million people, of which 3.5 million are women. The project also aims to reestablish a stable electricity supply and support regional integration."[59] Government officials have welcomed the announcement and committed to working with the World Bank in realizing the project's objectives. The World Bank has signaled that it will work with existing entities in the energy sector, and ESPs are already positioning themselves to benefit from this funding. Long stymied by lack of funding, ESPs see the World Bank's project as a vital opportunity to scale up their services.

ESPs are also showcasing the benefits of mini-grids as catalysts for clean energy. In Mogadishu, the largest ESP in Somalia is already generating about 20 percent of its electricity from solar, with the goal of scaling that up to 35 percent by the end of 2022. Another notable example is in Garowe, the relatively small but vibrant capital of Puntland State, where the local ESP is the National Electric Company of Somalia (NECSOM).

How NECSOM is Pioneering Renewable Energy in Somalia

NECSOM was established in 2003 following the merger of the two main ESPs in Garowe, the capital of Puntland. Many of the company's largest shareholders are businesspeople who have lived in the diaspora for decades and experienced the benefits of renewable energy elsewhere. In 2013, NECSOM executives decided to take the highly unusual step of transforming their company from a largely diesel-based ESP to a leading renewable-energy player in Somalia. "It was a daring mission," said one of its top executives. "Nobody was interested in renewable energy in Somalia. But we thought we could lead by example." Soon after, they commissioned studies to get an objective assessment of what the leap to renewable energy would mean for them in commercial terms.

Although a few ESPs in other parts of the country were dabbling in renewable energy, particularly solar, NECSOM executives opted to add wind turbines to their system – a risky but highly innovative investment. Although executives at NECSOM were partially motivated by environmental concerns, they admit that much of their decision was based on commercial calculations. Garowe lies about 450 kilometers away from Bossaso, the main port city of Puntland State, where diesel is imported and then transported over ground; and traditional, diesel-based generators were becoming too expensive to operate and maintain. In addition, oil storage facilities in Garowe were limited and not up to standard.

In 2015, NECSOM procured three wind turbines from Denmark to complement its solar plant. The company faced the daunting task of finding the right trucks to transport the turbines from the port city of Berbera in Somaliland, and the heavy-duty machinery needed to install them. NECSOM hired an Italian company to install the turbines, which are 35 feet high and weigh more than 25 tons. After much difficulty, the turbines were erected in the hills that loom over the city, giving them ideal wind access. Local engineers and technicians were trained to repair the turbines and solar when they encounter technical problems. NECSOM is currently the only ESP operating wind turbines to generate energy in Somalia.[60]

For NECSOM, the investment was worth the risk. The company is currently generating approximately 22 percent of its total installed electric capacity (3 MW) from wind turbines and a solar plant. NECSOM intends to install an additional 3 MW in the coming years. Residents of Garowe are also paying substantially less for energy than they did before NECSOM installed the turbines. The average retail kWh costs $0.59, down from $0.97 just a few years ago. The company aims to further reduce the cost to $0.39 in the coming years as additional renewable-energy capacity is brought on line.

Although it has approximately 20,000 connections, NECSOM puts an emphasis on corporate social responsibility in Garowe. It provides free electricity to public hospitals, police stations, mosques, and even streetlights. "Our profit margins are extremely tight because of our philanthropic work, which we are proud of, and the relatively small consumer base," said a senior executive.

"The NECSOM example could be a template for the rest of Somalia," said a former environment official in Somalia. "ESPs should be nudged and incentivized to go green, but that would require harmonized national and state-level policies."

Officials at the MEWR hold the view that, ultimately, a national grid is the only network that could properly interconnect the country's disparate energy sector. However, they recognize that building a national grid is years – if not decades – away. In the short and medium terms, the ministry is prioritizing the harmonization of federal and state-level policies to standardize the prices and quality of electricity across the country. Federal officials are also supporting the states to strengthen their regulatory and oversight capacity over ESPs.[61]

The NECSOM system described above is displayed in this report's cover photo and the photo on page 24.

Renewable Energy in Somalia: Potential, Momentum, and Challenges

The growth of renewable energy around the world is facilitated and supported by several factors, including access to debt financing, supportive governmental regulatory frameworks, collaboration with utilities in consolidated energy markets, and climate-driven mandates. According to data from the Federal Government of Somalia, only about 10 percent of the country's electricity is generated from renewable energy as of 2021 despite its immense potential: Somalia has the highest resource potential for onshore wind power in Africa,[62] and the country experiences 3,000 hours of sunlight per year with daily solar radiation ranging between 5-7 kWh/m2 per day, which equates to strong solar photovoltaic electricity generation capacity.[63] The country could potentially produce up to 45,000 MW from wind and 2,000 MW from solar power.[64] Nearly all of the electricity generated from renewable sources currently comes from ESP-owned solar power projects. The ESP with the largest portfolio is Benadir Electricity Company (BECO), which dominates electricity provision in Mogadishu, the most lucrative market in the country. As of December 2021, BECO was generating roughly 9 MW from solar energy out of an estimated 30 MW total installed capacity. The company is in the process of scaling up its solar photovoltaic capacity by an additional 25 MW by the end of 2022.[65] Despite the absence of meaningful government oversight, BECO and other major ESPs are scaling up their renewable-energy capacity purely for commercial reasons. "As long as we can mobilize the capital required to scale-up our renewable energy capacity, we calculated that it is enormously profitable for us to go green," explained one executive from a major ESP, adding, "Plus, it's good for the environment."[66]

Companies in major cities are ramping up their renewable-energy projects. ESPs in Kismaayo, Adaado, Bossaso, and other smaller cities are increasingly opting for solar as an additional source of energy. Although these companies are constrained by the substantial financial investment required to significantly upgrade to solar or wind power, they are beginning to dip their toes into the renewable-energy ecosystem in a bid to remain competitive and relevant. Most ESPs in midsize cities use hybrid generation, primarily diesel generators with some solar, according to an MEWR official. There is also growing consumer demand. An ESP executive in Baidoa, whose company is exploring solar as a hybrid option, noted that customers are increasingly asking about the source of energy because they have friends and families in other parts of the country who pay less for cleaner energy.[67]

While the Federal Government of Somalia has a well-defined vision, at least on paper, to encourage ESPs to go green, it has stopped short of setting targets for them. In practical terms, the MEWR and the Directorate of Environment within the Office of the Prime Minister are constrained by their limited financial and technical capacity. Although both entities regularly engage ESPs and other actors in the energy sector, their ability to ensure accountability is partly limited by the continued lack of clarity in the division of responsibilities between the government and federal member states.

Lack of Access to Financing

One of the biggest challenges for ESPs to significantly expand renewable-energy usage is access to financing. The up-front capital required to switch from diesel-based generators to solar or wind turbines is substantial and often prohibitive. Moreover, Somalia's banking sector is in its infancy stage and does not have a strong culture of financing large private projects. The adverse economic impact of COVID-19 has made commercial banks risk-averse, with a preference to "hold liquid cash rather than lend to the private sector in 2020."[68] As most ESPs are small companies with small profit margins, they are unable to mobilize the needed resources to make the switch, though several ESPs have been able to gradually increase their solar and wind turbine capacity.

The most notable is BECO, the largest ESP in Somalia. The company was able to finance its renewable capacity through equity raised from its shareholders. Although the company would not disclose the amount it is investing

in its new 25 MW solar plant in Mogadishu, MEWR officials and other experts have estimated it to be nearly $50 million – a huge sum for a relatively new company with only about 100,000 connections in Mogadishu.[69] Government officials note that BECO is also linked to the Hormuud conglomerate, which has the financial might to make such an enormous investment. Irrespective of the size of investment, BECO executives appear determined to expand their renewable-energy capacity for both environmental and commercial reasons.

In Garowe, NECSOM was also able to finance its three wind turbines and solar plant through shareholders' equity – a very common practice in Somalia. However, this led to shrunken profits given the high capital costs injected into the company and the expansion of shareholders. Company executives have been trying to further scale up their renewable-energy sources over the past few years, but lack financing. With a modest customer base, NECSOM is carefully balancing its investments against its bottom line.

Somalia ranks in the top 5 percent globally in terms of energy cost, and the top 15 percent in expenditure on power as a share of gross national income per household.

Financing is an overarching problem for the private sector in Somalia, where the banking sector is still nascent and unable to provide substantial access to capital. Despite considerable growth since 2012, the vast majority of the population remains unbanked, depriving banks of much-needed cash. Moreover, regulation is lagging in the banking sector, making it difficult for financial institutions to inject substantial sums into private companies. For those reasons, ESPs struggle to raise cash to help finance renewable-energy projects, and instead rely heavily on equity raised from shareholders to finance big projects.

Peace Dividends of Clean Energy

Despite its modest beginnings, renewable energy may already be contributing to peace and stability in many ways. More power from solar and wind means less reliance on diesel, which is imported into the country and requires transportation from seaports to points of generation. Al-Shabab controls significant parts of the major supply routes across the country and generates substantial revenue from levying taxes on the movement of goods and people. As more ESPs install solar and wind turbines, they reduce their diesel requirements and deprive Al-Shabab of direct financing.

The price of electricity has also gone down considerably in cities where local ESPs have increased their renewable-energy capacity. This is the case in Mogadishu, Hargeisa, and Garowe, among others. More affordable electricity means that businesses can create more jobs in a country where unemployment hovers around 70 percent. Al-Shabab is known to recruit young men from the most deprived communities, offering them small stipends to join ranks. Most young people would not join al-Shabab if they could find other opportunities. Somalia's National Development Plan recognizes youth as one of the most vulnerable groups in the country, and unemployment among this group is seen as a national security threat.[70]

Political Economy of Energy

As a result of almost nonexistent regulation and oversight by federal and state authorities, the energy sector in Somalia is extremely competitive among some of the biggest companies in the country. The cutthroat competition among these companies "gradually brings down prices for consumers," said a senior MEWR official who also

NECSOM Power Plant, Garowe, Puntland State of Somalia *Photo: Faaris Adam*

said the government lets the market regulate its pricing.[71] These companies are often linked to the largest conglomerates in the country. For example, BECO, the largest ESP in Somalia, is part of the Hormuud ecosystem, the largest corporation in Somalia. Similarly, Dahabshiil, the second-largest conglomerate in the country, is a shareholder of one of the main electricity companies in Somaliland. Another key actor is Hass Petroleum, a major player in the energy sector with businesses across the Horn of Africa. These companies are thriving in part because they have thousands of Somali shareholders and are turning good profits on an annual basis. Importantly, the executives, who are often the founders, are successful businesspeople with generally positive reputations within Somali society.

Over the decades, these companies have professionalized their commercial operations, and as a result they have positioned themselves as credible actors in the energy sector. BECO provides electricity to several major clients inside the Aden Adde International Airport in Mogadishu, including Favori, the Turkish company that operates the airport. Most western embassies, UN entities, and AMISOM are headquartered inside the airport. However, BECO does not currently provide electricity service to the UN, although there have been discussions between the two entities to explore that option.[72] Currently, UNSOS generates electricity for itself as well as for UNSOM and AMISOM, which is further explored in the next section of this report.

4. DIESEL-POWERED PEACE OPERATIONS: THE UN AND AMISOM

The benefits gained from renewable energy could also have a positive impact on peace operations in Somalia. AMISOM troops spend considerable time and resources protecting goods transported between major cities, including fuel. Renewable energy would significantly reduce demand for AMISOM patrols of major supply routes and allow the mission to focus more of its resources on core areas of its mandate.

The international peace operations in Somalia have a unique set of arrangements. While AMISOM and the UN play an important role in Somalia's political and security context, their role in Somalia's energy sector is less documented and understood. Yet the missions are among the largest consumers of electricity in Somalia. Their energy requirements are almost entirely met through a UN-operated electricity infrastructure that operates in parallel to those of the commercial providers described earlier. The total generation capacity of the UN-operated infrastructure is significant; while local grids throughout Somalia have an estimated total generating capacity of 120 MW, UN-owned generators alone can provide up to 65 MW of power. The UN's generation capacity is the equivalent of half of Somalia's energy generation, and comes almost entirely from diesel, not renewable, energy. That need has not, to date, been leveraged to help drive greater use of mini-grids and greater access to energy for the people of Somalia.

Overview of the UN Presence in Somalia

More than two dozen UN organizations and entities maintain a presence in Somalia, of which the largest are a special political mission, the UN Assistance Mission in Somalia (UNSOM); and a logistical support office, the UN Support Office in Somalia (UNSOS).

UNSOM was established by the UN Security Council in June 2013 to provide policy advice to the Federal Government of Somalia on peacebuilding and state-building, to assist in the coordination of international donor support, to help build the capacity of the Federal Government of Somalia on human rights, and to help monitor, investigate, and prevent human rights abuses in Somalia.[73] UNSOM is headed by the Special Representative of the Secretary-General (SRSG) for Somalia, who is the senior UN official in the country. The SRSG is supported by two deputies at the level of Assistant Secretary-General (ASG); one deputy is responsible for political, human rights, electoral affairs, and rule of law and security aspects of the mission mandate, while the other serves concurrently as Resident Coordinator and Humanitarian Coordinator.

UNSOS is the successor to the UN Support Office for AMISOM (UNSOA), which was originally established by the UN Security Council in January 2009 to provide logistical support to AMISOM.[74] UNSOS was established in 2015 with a broader mandate to support UNSOM, AMISOM, and the Somali National Army.[75] The support provided by UNSOS to AMISOM – at UN cost – includes the supply of fuel and rations, medical services and evacuation, air transportation, and rotation of contingents. Support provided by UNSOS to the Somali National Army is funded through voluntary contributions from UN member states provided to a trust fund. The head of UNSOS holds the rank of ASG and is responsible for strategic engagement with the African Union, AMISOM and its troop- and police-contributing countries, and other partners. Reporting to the head of UNSOS is a director responsible for managing the operational support activities of UNSOS who simultaneously serves as director of mission support for UNSOM. Under the director, UNSOS is organized into three pillars in much the same manner as the mission support components of large peace operations, with an operations and resource management pillar, a service delivery management pillar, and a supply chain management pillar. In addition, several units report directly to the director of UNSOS, including a small (i.e., one person) environmental unit responsible for, inter alia, monitoring implementation of the mission environmental action plan under the broader Secretariat Environment Strategy for Field Missions.

UNSOM and UNSOS are subject to different administrative and budgetary arrangements. While UNSOM is funded through the UN program budget, UNSOS is funded through a special account in the same manner as a UN peacekeeping operation. A cost-sharing arrangement is in place for services provided by UNSOS to UNSOM. Responsibility for issues related to UNSOM and UNSOS at headquarters are handled by different departments, with the Department for Political and Peacebuilding Affairs responsible for the former and the Support Partnerships Service of the Department of Operational Support responsible for the latter. To help overcome this bureaucratic fragmentation, field-level coordination mechanisms are in place that include both UNSOM and UNSOS that are similar to those commonly found in multidimensional mission contexts, such as the senior leadership team, security management team, and weekly UN country team meetings. The common mission support services provided by UNSOS, including for budget and financial management, also provide a point of integration between the two entities. It should also be noted that the UN Office to the African Union in Addis Ababa supports both political engagement between the UN Secretariat and the African Union Commission as well as operational coordination – through its institutional and operational partnership section – on issues related to the planning, support, and management of AMISOM.

Coordination between the UN and AMISOM occurs at several levels. At the most senior level, a monthly senior leadership coordination forum meeting brings together UNSOM, UNSOS, and AMISOM leadership to address issues related to strategic coordination. On operational issues, there are periodic meetings between the AU Special Representative of the African Union Commission Chairperson for Somalia and the UNSOS ASG, and at the technical level there is regular engagement between UNSOM sections and their counterparts within the AMISOM integrated support services structure. At AMISOM force headquarters, the force chief engineer is a key counterpart on issues related to fuel requirements, and each AMISOM contingent has military desk officers who serve as liaisons on issues related to the logistical requirements of their respective contingents.

Climate Security Advisor

The UN in Somalia is able to draw upon the expertise of a dedicated climate security advisor, the first such position in a mission setting. The position reflects the fact that UNSOM has, for several years, identified climate-related shocks as a driver of insecurity in Somalia, along with al Shabab attacks, activities of ISIL affiliated groups, and interclan tensions.[76] The responsibilities of the position primarily fall into three areas, namely (1) engagement with regard to climate-related aspects of peace and security, (2) building resilience in communities against the impact of climate change, and (3) supporting UNSOM in the reduction of the carbon footprint of the UN in Somalia. Established in June 2020, the position is funded through extrabudgetary resources and based in the resident coordinator's office.[77]

The climate security advisor is the only UN capacity that examines issues related to climate and environment in a cross-cutting manner that encompasses both mission support and substantive aspects of the mission. There has been discussion of establishing a joint environmental committee that brings together all relevant UNSOM and UNSOS sections along with the relevant AMISOM counterparts, but to date this has not been operationalized despite regular engagement on this issue by the UN with AMISOM counterparts.

Current Power Landscape

UNSOS is responsible for providing electricity to more than 20,000 UNSOS, UNSOM, and AMISOM personnel[78] in 79 locations across Somalia. AMISOM personnel, which represent the majority of the population served, are deployed in 77 of these locations (i.e., all except Garowe in Puntland and Hargeisa in Somaliland). Of the 79 locations served, 46 are accessible by road; the remaining 33 locations are accessible only by air because AMISOM has not been able to secure the main supply routes within the country.[79] As a result, UNSOS flew more than 2.5

The UN Secretary-General's Special Representative for Somalia, James Swan, addresses Ugandan soldiers serving under the United Nations Guard Unit (UNGU), during a medal award ceremony in Mogadishu to mark the completion of their tour of duty in Somalia, on 16 July 2019. *Photo: UN Photo/Ilyas Ahmed*

million liters of fuel by air in 2021, nearly 2 million of which was diesel. Even absent the threat of ambushes and improvised explosive devices, travel by road can be challenging in Somalia, as road conditions are generally poor, and many roads are impassible during the rainy seasons (mid-March through June and mid-September through November).

Electricity requirements for the UN country team in Somalia are met by UNSOS only in locations where the agencies, funds, and programs are co-located in UNSOS-managed compounds. Where the agencies, funds, and programs rent office space and accommodations, as is the case in Mogadishu, electricity is generally provided by landlords through cost-recovery arrangements.[80]

In January 2021, UNSOS finalized an energy infrastructure management plan (EIMP) covering UNSOS, UNSOM, and AMISOM to guide the management and optimization of its overall energy performance. EIMPs, which missions are required to develop under the Environmental Policy for United Nations Field Missions, are intended to help missions achieve the objectives of the UNSCAP and the DOS Environment Strategy for Peace Operations. The UNSCAP, which was finalized in 2019 as a 10-year plan to radically transform the activities of the Secretariat to reduce greenhouse gas emissions and improve the sustainability of its operations, includes targets such as reducing total and per capita carbon emissions by 25 percent by 2025 and 45 percent by 2030, and increasing the proportion of consumed electricity from renewable sources to 40 percent by 2025 and 80 percent by 2030. The EIMP developed by UNSOS also takes into consideration the fact that fuel convoys supplying AMISOM sector headquarters and forward-operating bases are one of the primary sources of vulnerability for AMISOM

contingents, thus creating an added security imperative to reduce UNSOS fuel consumption.[81]

UN-Owned Diesel Generators

The electricity requirements in Somalia for UNSOS, UNSOM, and AMISOM are almost entirely met through UNSOS diesel electric generators. With the notable exception of Garowe, which is supplied by a local grid,[82] UNSOS obtains only a negligible amount of electricity from external sources in Somalia. The UNSOS support base in Mombasa, Kenya, is connected to the national grid, but also maintains its own diesel generators as a backup capacity. As of September 2019, UNSOS operated a total of 363 UN-owned diesel generators in Somalia, with a total theoretical capacity of 65 MW; this figure does not include generators owned by either AMISOM contingents or the UN guard unit. In practice, generator operating capacity is generally far lower than installed capacity because of maintenance and downtime. UNSOS power and generator requirements are estimated based on data for the maximum load of existing infrastructure, plus an additional 20-30 percent overhead to account for possible unforeseen additional requirements. Altogether, the current electricity infrastructure requirements, consisting of both diesel electric generators and associated fuel consumption, are estimated at 5.6 percent of the total UNSOS budget,[83] or approximately $30 million per year. This figure does not include associated costs, such as the in-country transport or protection requirements of fuel supplies.

> Only about 10 percent of the country's electricity is generated from renewable energy as of 2021 despite its immense potential: Somalia has the highest resource potential for onshore wind power in Africa.

Contingent-Owned Equipment (COE)

Although electricity requirements for UNSOS and its clients are provided by UNSOS almost exclusively through UN-owned generators, the UNSOM guard unit and the various AMISOM contingents also deploy diesel generators, generally ranging in size from 30-150 kilo volt amps (kVA), to support military and police operations. A significant proportion of AMISOM contingent-owned generators are not operable at any given time,[84] and contingents are not required to provide records of how much fuel is used or how much electricity is generated by each.[85] A 2020 audit by the UN Office of Internal Oversight Services (OIOS) found that the average serviceability of AMISOM COE was 63 percent for major equipment (including generators and vehicles) and 56 percent for self-sustainment. The level of serviceability varies widely by contingent; OIOS noted that, during the period under review, one contingent had an average serviceability rate of only 32 percent for its major equipment.[86]

This level of equipment serviceability is far below that of contingents in UN peace operations. UNSOS officials interviewed for this study suggest that one major reason for this is that AMISOM lacks the financial penalties that exist in UN peace operations to incentivize the maintenance of equipment operability. In 2013, the UN General Assembly adopted resolution 67/251 which, inter alia, introduced a deduction to the reimbursements to contributing countries for members of their military and police contingents deployed to UN peace operations on account of nonfunctioning major equipment to reflect the fact that a unit is only able to perform its tasks if its major equipment is functional. This deduction was viewed by several officials as a further incentive for contingents to ensure that their equipment is properly maintained to a state of operational readiness.[87] However, as personnel reimbursement to AMISOM troop- and police-contributing countries is paid by the European Union at rates determined by the European Union and not the UN, the deductions introduced in resolution 67/251 do not currently apply to AMISOM contingents.

Although AMISOM is not a UN peace operation, the UN Security Council, in resolution 2036 (in 2012), authorized the payment of reimbursement by the UN to AMISOM troop- and police-contributing countries for major equipment, including diesel generators.[88] In 2015, the UN Security Council adopted resolution 2245 to expand reimbursement to cover costs for catering, communications, cleaning, office supplies, and tentage; these costs are among those reimbursed as self sustainment in UN peace operations. UN Security Council resolution 2245 also stipulated that UNSOS is responsible for the provision of fuel to AMISOM contingents; this is in line with the provisioning of petroleum, oil, and lubricants to military and police contingents in UN peace operations. The revised responsibilities of UN support to AMISOM through UNSOS were subsequently reflected in a memorandum of understanding (MOU) between the UN and the African Union for the provision of support to AMISOM signed on December 11, 2015, and in tripartite MOUs signed with each of the AMISOM troop- and police-contributing countries.

In general, the policies, standards, and rates of reimbursement reflected in the UN manual on policies and procedures concerning the reimbursement and control of COE (hereafter referred to as the COE manual) also apply to eligible categories of COE in AMISOM. Under the COE system, individual items of major equipment listed in signed MOUs are eligible for reimbursement on a quarterly basis if they are determined to be operational during quarterly inspections. The COE manual provides different rates of reimbursement for generators deployed as major equipment based on their kVA ratings. Renewable-energy systems and hybrid generators were introduced as new categories of major equipment eligible for reimbursement in the 2017 edition of the COE manual.[89] However, interviews conducted as part of this report confirmed that there has been negligible uptake of these new categories of equipment because few troop- and police contributing countries have such equipment. [90]Moreover, given that the UN supplies diesel for free to contingents, troop- and police contributing countries currently have little incentive to switch from diesel generators.

The main difference in how the major equipment is managed for AMISOM when compared to UN military and police contingents – including the UNSOS guard unit – is how the list of eligible equipment is determined for inclusion in MOUs. Contributing countries in UN peace operations can only deploy and be reimbursed for major equipment as agreed in MOUs; these are based on statements of unit requirement, which in turn are derived from mission plans and concepts of operation. In contrast, the major equipment listed in the AMISOM tripartite MOUs reflect what was already deployed by AMISOM troop- and police-contributing countries in Somalia when these agreements were signed, without reference to actual operational requirements determined through structured military and police planning processes. The UN Security Council has noted the mismatch between the equipment deployed to AMISOM and the equipment actually required for AMISOM operations under the current mission mandate, and has therefore urged AMISOM to develop statements of unit requirement and to right-size its COE. An equipment review initiated in 2019 has stalled, in part due to the ongoing review of the AMISOM concept of operations; it has yet to be completed.[91]

Training and Equipment

Shortfalls in COE and deficiencies in training – including both operation and maintenance of major equipment – are not unique to generators and electricity requirements. Several major financial contributors provide bilateral assistance to individual troop- and police-contributing countries to address training and equipment requirements. In recent years, the Secretariat itself has also begun delivering training to troop- and police-contributing countries, including engineering training through the triangular partnership program managed by the Support Partnerships Service in the DOS. These programs, however, do not currently include training on the installation, use, and maintenance of renewable-energy systems. There is also currently no use of this platform as a means to strategically engage donors to adapt their bilateral training and equipment programs to encourage a shift away from reliance on diesel by contingents. The transition from AMISOM to AU Transitional Mission in Somalia (ATMIS) may provide the impetus for finally ensuring alignment between the equipment deployed and the equipment required for operations in Somalia.

Al-Shabab controls significant parts of the major supply routes across the country and generates substantial revenue from levying taxes on the movement of goods and people. As more ESPs install solar and wind turbines, they reduce their diesel requirements and deprive Al-Shabab of direct financing.

Diesel Power and Fuel Consumption

Power generation represents the largest source of greenhouse gas emissions by the UN and AU in Somalia, as both are heavily reliant on diesel generators to supply electricity. During the 2020-21 financial period, UNSOS and its clients consumed more than 25 million liters of diesel and more than 10 million liters of jet A-1 aviation fuel. Of the diesel consumed, more than 20 million liters – over 80 percent – was for generators, with the remainder used for vehicles.[92] Most fuel supplied through UNSOS was used in support of AMISOM, though per capita consumption by UN personnel was significantly higher than per capita usage by AMISOM personnel, because of the greater use of air conditioning and other energy-intensive activities and practices.

As noted earlier, UN Security Council resolution 2245 established that UNSOS would be responsible for providing fuel to AMISOM contingents. The same resolution also mandated UNSOS to provide logistical support, including fuel, to Somali security forces on joint operations with AMISOM. All such support, however, is funded through the trust fund in support of the Somali National Army and not through the UNSOS budget. It is notable that the Somali security forces supported by UNSOS use less fuel than AMISOM contingents on a per capita basis. In assessing this discrepancy, UN officials interviewed pointed to the fact that fuel is not provided for free to the Somali National Army as it is for AMISOM contingents, but rather is charged against the trust fund.[93] That said, it is difficult to precisely determine the impact of the different approaches to the provisioning of fuel on consumption because the total amount of support provided by UNSOS to the Somali National Army is limited by the amount available in the trust fund, which is voluntarily funded. The operational demand for fuel is also limited by the Somali National Army's modest levels of equipment.

In recent years, UNSOS has taken significant steps to reduce its diesel consumption through a two-phased approach focusing on the two largest areas of diesel consumption. The first phase focused on reducing the fuel consumed by UN-owned generators in Mogadishu; the second focused on reducing the amount of fuel consumed by contingents. These efforts succeeded in reducing UN diesel consumption from 41 million liters per year in the 2016-17 financial period to approximately 25 million liters per year by the 2019-20 financial period. The reduction in diesel use over this period also reduced the fuel budget from $56 million to approximately $35 million.[94] UNSOS has also taken steps to reduce the environmental impact of diesel distribution in recent years. For example, fuel drums used to transport diesel by air are no longer only used once before they are abandoned or sold for scrap by contingents. Now, contingents are required to track and reuse drums issued to them, and can only have drums replaced when evidence is provided that they can no longer safely hold fuel.[95]

Assessing the actual fuel requirements for AMISOM contingents is challenging because of the unpredictability of AMISOM operations, inflated fuel consumption figures from prior financial periods, the lack of functioning odometers in some contingent owned vehicles, and rampant fuel theft by contingents. Fuel theft – which is not an issue specific to UN activities in Somalia – is a perennial issue that has been the subject of several high-profile corruption cases, including in 2013[96] and 2016,[97] and has routinely been flagged by auditors. To address these issues, UNSOS introduced the practice of capping bulk fuel allocation to AMISOM at a level based on indicative consumption rates for eligible COE, based on a combination of historical consumption data and the consumption rates of comparable types of UN-owned equipment, including diesel generators. These are referred to on the ground as "push quantities." UNSOS has also instituted the practice of assigning bar codes to all equipment eligible for fuel and requiring all fuel transactions to be scanned, thus ensuring that records are available in the electronic fuel management system, and that fuel is only being provided to eligible equipment. Fuel flow meters and tank gauges will also be installed as part of the implementation of the Unite Field Remote Infrastructure Monitoring platform, therefore providing another source of data to monitor usage and help plan for future requirements.

These efforts to reduce AMISOM fuel consumption have already begun to yield results. An audit of fuel management by the OIOS covering the period from July 2016 to December 2018 highlighted examples of activities flagged by the new procedures. Those examples included requests for bulk fuel that far exceeded estimated consumption given the actual serviceability levels of AMISOM equipment in February 2018, and 12 vehicles reported to have consumed 215,000 liters beyond their expected capacity of fuel in June 2018. In addition, UNSOS identified and rejected duplicate or fraudulent requests amounting to 274,000 liters of fuel between September and December 2018. Overall, the auditors found that UNSOS efforts to monitor and cap fuel allocations to AMISOM contingents significantly reduced monthly fuel consumption without affecting the overall level of AMISOM operations.[98] Even so, fuel theft remains a problem in Somalia despite the measures taken to improve controls. In 2019, 429 pieces of fuel-consuming equipment were identified as having received 3.8 million liters more fuel than their standard capacities during an eight-month period, and there were at least 15 documented incidents of fuel theft from generator tanks.[99]

Renewable Energy

As noted above, the state of the energy sector and environmental conditions in Somalia provide ample possibilities for greater use of renewable sources to meet electricity requirements in Somalia. Despite the high potential for wind power in Somalia, UNSOS has yet to meaningfully explore this option. Mission staff cited several reasons for this, including the lack of successful precedents for the use of wind power in other peace operations, logistical and security challenges for the installation and maintenance of wind turbines in Somalia, the impracticality of installing wind turbines at Aden Adde International Airport, as well as the absence of relevant expertise and contracts for wind power at both the field and headquarters levels.[100]

Another option for the UN is solar power, for which the Secretariat already has systems contracts in place. As documented in other Powering Peace reports, the use of solar power by UN peace operations is gaining traction, but still faces several challenges including the high up-front financing requirements, which has limited the scale and pace of its adoption.[101] Until recently, the use by UNSOS of solar energy was limited to rooftop solar water heaters, communications equipment, drinking-water treatment plants, and small panels to power walkway lights. Only recently has the mission expanded the use of solar power to meet electricity requirements, through several initiatives led by different UNSOS sections.

Ongoing Initiatives

The most advanced ongoing initiative is the Green ICT (information and communications technology) initiative run by the Field Technology section. Green ICT, launched in 2019, is aimed at transitioning ICT services throughout Somalia – including in Mogadishu, the sector headquarters, and all forward-operating bases where UNSOS provides services – to renewable energy at the level of the access and distribution network layers. The total generation capacity of the project, once fully implemented, is estimated to be approximately 423 kW, a minuscule fraction of the amount currently generated through diesel. These installations, which are generally separate from the main power grids maintained by the Engineering section in each location, consist of microgrids with solar panels, photovoltaic inverters, and a battery bank, all enclosed in an IP65-certified weatherproof telecommunications cabinet. The impetus for the project was the need to address unacceptable interruptions in ICT services caused by power outages stemming from diesel generator-related issues. Although this project was originally intended to be completed within a three-year period, implementation has been delayed because of challenges with logistics, shortages in personnel, and the COVID-19 pandemic, with only 24 out of 96 planned installations completed as of September 2021.[102]

Other ongoing initiatives include the installation of solar panels at all fuel retail stations, which is projected to reduce fuel usage by approximately 250,000 liters per year and reduce contracted operations and maintenance costs by approximately $240,000 per year once installation is completed. The mission has also procured 75 solar-powered water treatment plants, though these have not yet been installed because of a lack of in mission expertise.[103]

There are several obstacles to the broader use of solar power to meet the general electricity requirements of UNSOS and its clients. A major constraint is the limited availability of space for the installation of solar panels. The Engineering and Facilities Management section has begun a process of installing solar panels with a total peak capacity of 500 kilowatt-peak (kWp) atop buildings and prefabricated structures in the UN compound at the Aden Adde International Airport in Mogadishu. The required equipment is already available through systems contracts maintained at headquarters, and UNSOS has made use of assistance from the Global Service Centre in Brindisi, Italy, on statements of work. From a security perspective, solar arrays are also vulnerable to mortar attacks, which are frequently used against UN and AU positions across Somalia. The harsh environmental conditions also contribute to corrosion that can reduce the estimated useful life of solar-generation equipment and batteries. Another challenge has been the limited in-house expertise for implementing solar projects.

There are practical limits to what can be achieved by solar panel installation in Mogadishu given considerations such as the limited rooftop real estate, the fact that existing prefabricated buildings are not designed to mount solar panels, and the suboptimal orientations of hard-wall buildings for solar collection. In addition, the airport authority in Mogadishu has resisted installation over concerns that reflections from solar panels could affect airport operations, though experience from an initial set of rooftop installations appears to indicate that this concern is not entirely warranted.[104] That said, the Engineering section intends to continue installing additional solar panels with a combined capacity of between 250 and 500 kWp per year, including in locations outside

Mogadishu. While commendable, this approach will increase the proportion of power generated through renewable energy by less than 1 percent each year.

Kube Energy and the Baidoa PPA

Another major challenge for increasing the UN's adoption of renewable energy is the requirement of up-front financing. Despite the significant measures taken to reduce fuel consumption and the steady roll-out of various UNSOS solar initiatives, the UN is far from being on track to meet its UNSCAP targets. Currently, solar power provides only approximately 0.5 percent of the total electricity generated by UNSOS,[105] and most of the existing solar installations exist to meet specific requirements rather than more general electricity requirements. UNSOS has looked outside for a solution to help scale this transition, breaking new ground for peace operations in the process.

In 2018, Kube Energy, a Norwegian renewable-energy company specializing in solar solutions for humanitarian and development operations, initiated a dialogue with UNSOS. The discussion focused on Baidoa, the capital of Southwest State, because of interest shown by the government of Southwest State, which in parallel had signed an MOU with Kube Energy in July 2018. Under the MOU, Kube Energy was to establish a solar power plant in the Green Zone at a location adjacent to the Baidoa international airport. The UN was interested in purchasing power from this future solar-power project, but progress stalled as a result of a combination of factors, including a change in UNSOM leadership, debates on the structure of the project, and a change in the leadership of Southwest State.

Discussions with UNSOS resumed in the second half of 2019. Kube Energy planned to build a solar-power plant in the Green Zone adjacent to the UN compound in Baidoa that would be built out in phases. According to the initial concept, the solar project would be big enough to meet the needs of the UN (including its activities in support of AMISOM) and those of the state government, and would provide some energy during the day to the local utility company; a second phase would focus on meeting broader electricity needs of the community by supplementing the power generated by the same local utility company in Baidoa and reducing electricity prices. After 15 years, the power plant would be handed over to the state government, therefore contributing to local infrastructure development in a sustainable manner. However, the project faced delays, including with regard to securing the rights to land, navigating regulations or the absence of regulations, COVID-19 restrictions, and the political situation in the country. Currently, the local company sells electricity at $0.90 per kWh. With Kube Energy, it could reduce the price to $0.50 per kWh.

Separately, Kube Energy concluded a power purchase agreement (PPA) with UNSOS in November 2020. Prior to the signing of the agreement, there was considerable debate within UNSOS[106] on the best structure (i.e., a solar system dedicated to the UN or a power plant providing for multiple offtakers); whether the relevant costs and risks associated with this new approach – including those related to the ability of Kube Energy to deliver – were truly understood;[107] how to manage potential disruptions from attacks on the system; political risks; and the need to amend existing fuel contracts.[108] The resulting agreement, however, places the up-front costs and all the risk on Kube Energy; and while it commits the UN to meeting its electricity requirements from Kube Energy during the contract period, it also allows the UN to terminate the PPA without penalty. From the UN perspective, the PPA simply offers the option to purchase a guaranteed amount of electricity from a vendor at a rate that, in theory, is lower than the status quo when considerations such as the costs of diesel, fuel transportation, generators, and generator maintenance are all factored in. Once operationalized, UN activities in Baidoa would essentially switch from diesel to renewable energy overnight, significantly reducing greenhouse gas emissions, improving local air quality, reducing the likelihood of fuel misappropriation issues in that location, and obviating the need for UNSOS to fly diesel fuel except in urgent circumstances. UNSOS would maintain its existing diesel generators, as well as a fuel reserve, as a backup in case of disruptions in supply through the PPA.

If the Baidoa PPA can be successfully operationalized, it can herald the start of a transformational shift for how UN peace operations can meet their own power requirements, while leveraging the purchasing power of the UN to support private-sector finance and construction of clean-energy infrastructure that can contribute to sustainable development in the country. Under the terms of the Baidoa PPA, Kube Energy is responsible for all costs related to the start-up and maintenance of the project, including the responsibility to secure all requisite agreements with local and federal authorities. Any services that Kube Energy might require from the UN, such as accommodations in the Baidoa compound, access to UN flights, and UN medical support, would be provided by UNSOS on a cost-recovery basis. The PPA is attractive from Kube Energy's perspective because the UN serves as an anchor client, providing a reliable source of revenue to make the project economically feasible. The UN's interest in making the project operational also makes it an important advocate for Kube Energy vis-à-vis local and federal authorities. In addition, the establishment of the Kube Energy power facility and reductions in the price of electricity are expected to have a positive effect on local conflict dynamics by reducing resource competition and tensions in the community, and boosting development opportunities.

In December 2021, Kube Energy concluded a land lease agreement with state government officials, paving the way for project implementation. It is expected to take 10 months to complete the necessary procurement, delivery, and construction to commission the power plant, with the project commissioning currently slated for the fall of 2022.[109] In the meantime, UNSOS continues with its existing diesel-reliant approach to power generation, flying in all of its diesel fuel for Baidoa.

Obstacles to Greater Use of Renewable Energy by the UN

The UNSCAP is not generally framed as a reform initiative, but – for the UN to meet its goals within the specified time frames, especially in diesel-reliant peace operations – the plan requires major shifts in mindsets, policies, increased funding, and practices on the order of those required for the implementation of major institutional reforms. Even so, the interviews undertaken for this report suggest that, since the announcement of the UNSCAP and its goals in September 2019, little has been done in concrete terms. The changes needed in internal business processes to establish accountability, or to undertake the requisite engagement with member states and intergovernmental bodies to put the UN in Somalia – let alone the broader Secretariat – on track to meet the targets, are not yet evident.

At the field level, the UN can only hope to meet its own targets under the UNSCAP through innovative approaches such as the PPA project model with Kube Energy. Although PPAs are used widely by commercial renewable-energy developers in developed markets, this is the first instance of its application in a UN field mission context. The PPA leverages the purchasing power and long-term presence of the UN to make the renewable-energy project investment economically viable even in a context as challenging as Somalia. It offers a relatively rapid and scalable path for UN peace operations to significantly increase their renewable-energy usage. If the project is successful, the longer-term benefits of providing clean, reliable, and affordable energy can also contribute substantially to sustainable development in Somalia.

Most importantly for implementation, the PPA model accounts for the difficulty faced by the UN in making significant changes to its business practices by obviating the need for UNSOS to finance and build its own renewable-energy infrastructure. It also shifts most of the financial and technical risks to an external partner. Yet for this model to scale, the UN cannot rely exclusively on private-sector companies to put together the pieces of each project. As seen in Baidoa, there are a range of complex actors and issues that must be navigated for a project of this nature to reach fruition, and most private-sector companies would not invest the time and resources required to do so. Rather, the UN should engage more proactively to help initiate and support new PPA-

type renewable-energy projects and to help see them through to implementation.

The PPA model is one that should be studied for potential implementation elsewhere in Somalia, as well as across other missions. The PPA offers one of the only realistic means by which UN peace operations can meet their UNSCAP renewable-energy targets. However, the existing approaches at headquarters and in the UN General Assembly serve as major obstacles to the consideration and implementation of the potentially transformational approaches required to reorient Secretariat activities to adapt to new and changing political and operational requirements. These challenges can be seen across several different areas.

> Altogether, the current electricity infrastructure requirements, consisting of both diesel electric generators and associated fuel consumption, are estimated at 5.6 percent of the total UNSOS budget, or approximately $30 million per year. This figure does not include associated costs, such as the in-country transport or protection requirements of fuel supplies.

Culture

Reform initiatives at the UN often suffer from insufficient investment in change management. Reforms such as the UNSCAP are often driven from headquarters, and while they may involve some engagement with affected Secretariat entities, including field missions, the resulting policy changes and targets are generally issued at a high level, without sufficient attention or resources invested in the development and implementation of entity-level implementation plans to translate vision into practice.

In addition, awareness on the part of staff members of headquarters-driven reform and policy initiatives, particularly those in the field responsible for program implementation or service delivery, can be uneven. Work plans and job descriptions for most staff members are seldom adjusted to align with reforms. The lack of meaningful mainstreaming of responsibility for change processes means that there is no individual-level ownership or accountability for change, and that most working-level staff members within the Secretariat see such reforms as abstract policy pronouncements from a distant headquarters that have little relevance to, and impact on, their day-to-day work. As a result, business proceeds largely as usual for most staff members and their respective organizational units.

In Somalia, the progress that has been made toward achievement of the UNSCAP targets – including on reducing diesel consumption, installing solar panels, and pursuing the Baidoa PPA – has largely been the result of efforts by individuals who proactively acted within the scope of their existing responsibilities to reduce the environmental impact of mission operations. Many of these efforts were initiated before the finalization of the UNSCAP, and the establishment of targets under the UNSCAP did not significantly change the approaches already underway. As commendable as these projects may be, however, they alone will not be enough to make a significant impact on either greenhouse gas emissions or the percentage of electricity generated from renewable sources. Moreover, the compartmentalized nature of these projects and their dependence on individuals to drive them forward means that what progress has been made is not sustainable institutionally, and can easily be lost if key staff members depart. Several individuals interviewed pointed out that the buy-in of senior mission leadership, as has been the case in Somalia, is particularly valuable in helping to enable motivated working-level staff members.

The inability of the UN to change its business practices is why arrangements such as the Baidoa PPA – in which a private-sector company, such as Kube Energy, bears the financing and project implementation risks – are so attractive, and they may be the only realistic means of significantly increasing the percentage of electricity generated through renewable sources in the short term. Despite the significant delays related to the operationalization of the project in Baidoa, the UNSOS has not prepared contingency plans or developed options for other locations across the country.

The challenges faced by the Secretariat in increasing its use of renewable energy should prompt reflection on how the principles of procurement, as contained in financial regulation 5.12, are applied. Interlocutors in UNSOS noted challenges in undertaking a cost-benefit analysis of the Baidoa PPA, given the difficulties in ensuring that all the costs associated with the existing diesel-based approach to electricity generation, including the costs associated with the risk of attacks and IEDs on fuel convoys and the costs of flying diesel to locations not accessible by road, were properly captured. But beyond ensuring a more comprehensive assessment of best value for money, the Secretariat should also consider how best to reflect, as part of the interest of the Organization, Secretariat-wide initiatives such as the UNSCAP as well as the reputational risks to the UN if its actions are seen to lag far behind its rhetoric on such critical issues as addressing climate change.

Structure

The uniquely complex structure of the UN presence in Somalia also creates additional challenges for approaching UNSCAP implementation in a coherent manner. The substantive and support components of the UN presence, for example, are contained in entirely separate Secretariat entities, and this only serves to complicate the ability of the UN to consider the operational and political opportunities and challenges of the shift to renewable energy. For many of the UN personnel in Somalia interviewed for this case study, there is a clear division of responsibility between UNSOM and UNSOS that complicates the ability of the UN to consider cross-cutting issues in a comprehensive manner. For example, issues related to electricity, including the Baidoa PPA, are approached as mission support issues; the impact of procurement decisions on conflict dynamics does not appear to have been a major consideration. UNSOM staff members reported that documents such as the mission environmental action plan – now monitored through an online platform known as eAPP (Environmental Action Planning and Performance) – are considered UNSOS documents and are therefore not shared with UNSOM staff, even though the plan covers all Secretariat activities in country.
The fact that AMISOM is not part of the UN further complicates the adoption of a coherent approach. This also creates a major dilemma for UNSOM; even though most of its activities – including the management of fuel – are used to supply or support AMISOM, AMISOM itself is not bound by the UNSCAP targets. AMISOM troop- and police-contributing countries generally resist efforts to increase accountability for fuel usage. There have also been significant delays in finalizing the review of operationally required COE that has repeatedly been requested by the UN Security Council.

The challenge of coordinating with AMISOM was keenly felt by the authors while preparing this case study. In addition to the organizational separation, the decentralized command-and-control structure within AMISOM, as well as the application of bureaucratic UN administrative and logistical procedures designed for supporting UN peace operations, complicate efforts to change AMISOM practices to promote more fuel efficiency and reduced environmental impact. That said, the designation of an environmental focal point in AMISOM headquarters is a positive development.

Some officials suggested that the establishment of a "joint environmental committee" chaired by the SRSG that brings together UNSOM, UNSOS, and AMISOM could help foster a common approach to environmental issues and serve as a mechanism to monitor progress in the implementation of the mission environmental action plan.

A joint working group of a joint environmental committee with the operations management team could also facilitate coordination with the UN country team.[110] While acknowledging that a more inclusive approach could help foster a broader sense of ownership and responsibility for environmental issues, other officials warned of the limits of a matrix approach to examining environmental and climate-related issues; they noted that the specialized subject matter expertise for some of the work and analysis required is not easily found within mission staffing tables, and therefore having dedicated posts or positions to examine such issues is necessary. [111]

Expertise

An obstacle that was raised during several interviews was the fact that specialized expertise – in areas ranging from the design and installation of renewable-energy systems to accurate assessments of the full costs of renewable energy when compared to the status quo – is lacking at the field level. This, however, is a limitation that is acknowledged by the mission; for example, in the ongoing recruitment for a vacant post in the Power Generation Unit, specific expertise in renewable energy is being sought. Although some UNSOS staff indicated that equipment, such as solar panels and batteries, is available through existing systems contracts, many indicated that the lack of capacity and expertise for installing solar systems was also a major challenge. Existing supply-chain arrangements, such as thresholds for the exercise of local procurement authority, the methodology for calculating best value for money, and the interpretation of the principle of the interest of the organization, can discourage missions from exploring out-of-the-box approaches to achieving the UNSCAP targets, such as adopting electric-vehicle fleets.

At headquarters, the organization and staffing of the Office of Supply Chain Management in the DOS remain geared toward most effectively supporting traditional approaches to managing field missions, including reliance on diesel fuel and diesel generators. Just as requirements such as life support and fuel have dedicated teams and arrangements in place for sourcing and acquisition, consideration should be given to ensuring that organizational arrangements and resources within the Office of Supply Chain Management are in place to promote and support the use of renewable energy. The establishment of an energy-category management strategy to review practices and support missions in achieving the associated goals in the Environment Strategy and in the UNSCAP is a positive development, but for now this work relies on existing capacities within the department.

Intergovernmental Processes

Budget processes at the UN are also a major obstacle to reform. The results-based budgeting framework that forms the basis for mission budgets is based on inputs and outputs, rather than on achieving outcomes. Budgets for existing missions are prepared each year by using the existing indicators from the previous results-based budget, as well as the approved resource levels, as the starting point. Such an approach to budgeting discourages changes in approach and only serves to entrench existing ways of doing business, especially for mission support activities.

Even if missions were willing to attempt to significantly change their approach to mission management and propose the requisite changes in budgets, they would then encounter a second – and often more intractable – obstacle, namely the intergovernmental budget review process. Budgets prepared by missions are considered first by the Advisory Committee on Administrative and Budgetary Questions before being submitted to the Fifth Committee of the UN General Assembly. In both bodies, budget discussions are focused on questioning changes in resource levels – including staff and nonstaff resources – and in outputs achieved. Mission efforts to increase efficiency and realize savings are often penalized with cuts to staff or nonstaff resources, instead of missions being allowed to reallocate those resources to other priority areas. The need for additional resources for cross-cutting requirements such as planning, or for "new" requirements such as data analysis, are often received with great skepticism.

Tamarso Energy Plant, Mogadishu, Somalia *Photo: Osman Nor*

More broadly, the fact that the Fifth Committee makes decisions on the basis of consensus[112] often means that the status quo is the default, and reform initiatives and proposals to change long-standing approaches often face uphill struggles when going through the intergovernmental process. And when such shifts in approach are proposed, the Secretariat often attempts to implement changes "within existing resources" to improve their chances of getting through the committees, even though the insufficient resourcing of change management, internal communications, and training means that whatever reforms are ultimately implemented by the UN General Assembly often flounder in their implementation. The reform processes that avoid this fate are generally those that are either small enough in scope that they can be implemented within the existing legislative framework or those significant enough to be elevated above the level of the Fifth Committee.

Operational Considerations

The fragmentation of the UN system also limits the extent to which the resources and expertise of the entire system can be leveraged to fully recognize the opportunities and challenges of new approaches such as the power purchase agreement. The Baidoa PPA was established with UNSOS primarily to meet mission support requirements, even though it can have an impact on the broader peace, security, and development objectives of various parts of the UN system. Similarly, the mission environmental action plan is approached as a mission support planning document – as it is driven by budget provisions – when its provisions should be aligned with broader UN system programming and business operations. The establishment of the position of climate security advisor is an important step toward bridging the gaps between UNSOS, UNSOM, and the UN country team, but is not itself sufficient to break down the silos that exist within the UN bureaucracy in the field. There is much more to be done to break down barriers and facilitate the communication required to get all stakeholders to recognize their respective responsibilities to climate action and to understand how improved cooperation with counterparts across the system can help them better implement their individual and collective mandates.

5. CONCLUSION

Somalia has faced a daunting set of challenges since the collapse of the state more than 30 years ago. Efforts to gradually reestablish state authority and a ruling government have evolved through fits and starts since the late 2000s, with climate change and the emergence of the al-Shabab insurgency playing an increasingly visible role in the last 15 years and adding to insecurity. This report has examined the evolution of the energy sector in Somalia, one of the least electrified countries in the world, and its role in the country's political, economic, and conflict dynamics. The study has also reviewed the energy practices of the missions deployed by the UN – and, by extension, AMISOM – in Somalia. Collectively, these missions, which represent the principal points of engagement by the international community in Somalia, are responsible for enormous energy supply and demand throughout the country. The research highlights the recent PPA signed between UNSOS and a commercial renewable-energy developer in Baidoa. This approach, innovative for the UN, provides a replicable and scalable model to meet the UNSCAP and DOS Environment Strategy targets, while increasing local energy access that could offer a range of peace and development benefits in Somalia.

Key Findings

First, Somalia is one of the least electrified countries in the world, a challenge that inhibits the country's economic potential and sustainable growth. However, the government has the opportunity to expand access to energy, particularly through renewable energy, to support a range of development, security, economic, and climate goals in the country. This is a matter of importance to the UN, including member states and the Secretariat, the Somali government, and the people of Somalia.

Second, Somalia's energy sector is extremely decentralized, and distributed mini-grids offer the most feasible way to rapidly expand energy access. The energy sector comprises mostly small and localized private-sector electricity service providers, who have evolved in the absence of a functioning government or government structures. Diesel-powered, localized mini-grids dominate, with al-Shabab earning revenue from the taxation of diesel supply chains, among other things, all across the country.

Third, renewable energy is feasible, offers numerous benefits to communities, and is drawing increasing interest from electricity service providers. Yet financing challenges are hindering growth, and the ability of the Federal Government and federal member states to help in this regard is limited. Somalia's vibrant private sector has filled many of the gaps in services traditionally provided by government, but the country's still low levels of electrification demonstrate the daunting challenges. Electricity service providers are increasingly interested in transitioning to renewable energy for both economic and environmental reasons, but the lack of a functioning banking sector makes the up-front financing requirements of renewable energy difficult to overcome. While a few promising examples have emerged, these are the exception rather than the rule.

Fourth, the UN/UNSOS can play a role an important role in supporting Somalia's energy transition, but faces institutional challenges of its own. The UN's transition to renewable energy has started and is driven by a number of factors – from practical considerations, such as the need to cut costs and mitigate the security impacts of its current dependence on diesel, to the institutional commitments reflected in the UNSCAP and the DOS Environment Strategy. The UN faces a number of hurdles in implementing this transition in Somalia; while some are unique to Somalia, others are rooted in the organizational culture of the UN. In addition to gaps in resources and expertise, at both the field and headquarters levels, a major challenge is the disconnect between high-level objectives and the work of individuals on the ground. The responsibilities and expected

contributions of units and individuals toward these organizational objectives remain undefined, and most of the progress made to date has been the result of efforts by individuals who proactively acted within the scope of their existing responsibilities to reduce the environmental impact of mission operations. If it can find ways to overcome these challenges, the UN can be an important partner and catalyst for new renewable-energy projects across Somalia and in other field missions, an outcome that would advance UN objectives on climate, environment, and peace and security.

Currently, solar power provides only approximately 0.5 percent of the total electricity generated by UNSOS.

Fifth, successful models exist. The Baidoa PPA presents an exciting new model for UN peace operations to partner with private-sector companies to launch new renewable-energy projects, offering a way to benefit UN missions and local communities. The Baidoa PPA between UNSOS and Kube Energy, and separately the memorandum of understanding between Kube Energy and the government of Southwest State, is breaking important new ground for UN peace operations. By engaging as an energy consumer and outsourcing its energy generation to the private sector, UNSOS can mitigate many internal challenges that hinder renewable-energy transitions at scale in field missions. At the same time, this model leverages the considerable purchasing power of UNSOS to make project financing viable for the private-sector partner. The partnership of Kube Energy with the government of Southwest State creates the conditions for the project and expands its benefits well beyond UNSOS to local government and, ultimately, to local communities. This model could be scaled elsewhere in Somalia, and beyond, and the UN should immediately look to expand this model to other locations.

Recommendations

To the United Nations Secretariat:

- **Update Mission Systems.** The Secretariat, supported by the General Assembly and Security Council as appropriate, should take advantage of the transition from AMISOM to the new AU Transitional Mission in Somalia (ATMIS) to complete long-delayed processes, such as the review of contingent-owned equipment and the establishment of the joint environmental committee.
- **Share Knowledge of PPAs.** The Department of Operational Support (DOS) should capture and document the lessons from the ongoing process of operationalizing the Baidoa PPA arrangement – which involves UNSOS, the regional government, and the private sector – and should share this knowledge widely across other peace operations and Secretariat departments.
- **Hire Climate Expertise.** The position of climate security advisor, currently funded through extrabudgetary resources, is a valuable resource that applies a climate lens to both the substantive and support elements of the work of the UN. The post should be regularized in Somalia and introduced in other UN missions.
- **Build Knowledge.** Gaps in capacity at headquarters and the field in areas such as climate security, implementation of renewable-energy systems, and environmental aspects of force generation and contingent-owned equipment should be identified and addressed through requests for additional resources or redeployment of existing resources. Where gaps in expertise are identified, these should be addressed through measures including dedicated recruitment drives or the potential establishment of standby

capacities that can be deployed as required to support individual missions and other Secretariat entities in a similar manner to other standby capacities based out of the Global Service Centre in Brindisi, Italy.

- **Monitor Progress**. Climate needs to be seen as an issue that transcends all lines of effort, whether substantive or support. In the Somalia context, a senior-level joint environmental committee that includes AMISOM should be established as a matter of priority, and one of its key responsibilities should be to monitor the implementation of the mission environmental action plan.
- **Stop Making Dielse the Default.** For mission support planning, diesel generators should no longer be the default option for producing electricity. As part of a broader portfolio of alternatives, long-term standby arrangements should be explored with private-sector companies for renewable-energy projects. Because it is more difficult for troop- and police-contributing countries to adjust how they generate power than it is for the UN Secretariat to do so, mission support planning should shift as much of the responsibility to missions as is feasible.
- **Calculate Full Costs.** Climate security considerations need to be factored into military planning and force generation processes. Contingent-owned equipment and memorandum of understanding management review boards need to be proactive about challenging operational requirements for diesel generators and other fuel-consuming major equipment and communicating this information to headquarters to inform negotiations and amendments.
- **Expand Private-Public Partnerships.** The Support Partnerships Service within the DOS at headquarters should adapt its triangular partnership program to include renewable energy. It should also actively engage with the private sector and with donor countries that provide training and equipment support to troop- and police-contributing countries to encourage a shift away from reliance on diesel by contingents.
- **Review Electricity Options.** To better guide missions and other entities toward renewable-energy solutions, the existing arrangements at headquarters for the planning, sourcing, and acquisition of electricity should be reviewed. This review should also examine the existing portfolio of available systems contracts and ensure that contracts are also available to meet installation, maintenance, and disposal requirements.

To the General Assembly:

- **Meet UN Climate Targets – UNSCAP.** In addition to supporting the recommendations proposed for the Secretariat, the General Assembly should hold the Secretariat and its entities accountable for meeting UNSCAP targets and for requesting information on progress to date, challenges faced, and plans to meet the targets.

To the Working Group on Contingent-Owned Equipment (COE):

- **Review Generator Standards.** The 2023 Working Group on COE should consider reviewing standards for generators provided as major equipment, including the possibility of requiring fuel flow or kilowatt-hour (kWh) meters to inform regular contingent reporting on kWh consumed and carbon dioxide footprint. As an alternative, the working group can consider introducing an approach to the reimbursement of fuel-consuming major equipment in which equipment that is operational, but without functioning odometers or fuel meters, receives a lower rate of reimbursement than equipment that allows for the monitoring of fuel consumption.

- **Reconsider Existing Equipment Categories.** The working group should also consider merging the electrical equipment category of self-sustainment into the accommodation category, as contingents also deploy generators for self-sustainment requirements under the category of electrical equipment, and such capacity is primarily for meeting the electricity requirements of camps.
- **Reinforce Accountability.** In addition, the working group should establish that contingents should be accountable for the fuel that they receive from the UN, including for how the fuel is distributed, used, managed, and stored.

To the Federal Government of Somalia (FGS):

- **Strengthen Capacity at the MEWR.** The FGS should continue to strengthen the technical capacity of the Ministry of Energy and Water Resources (MEWR) so that it can effectively regulate and provide oversight on the energy sector, especially electricity service providers (ESPs).
- **Harmonize Energy Policies.** The FGS should strive to harmonize its energy policies with those of federal member states with a view toward creating a stronger collaborative framework between the two, and enabling the standardization of both the quality and prices of energy in Somalia.
- **Incentivize Clean Energy.** The FGS should allocate adequate resources to help the energy sector overcome prohibitive financing challenges and leapfrog toward renewable energy. The FGS should promote clean energy and regain its oversight and policy-setting role. Incentives could include tax forgiveness to spur on direct foreign investment and import of renewable-energy material into Somalia.
- **Promote Public-Private Partnerships.** The FGS should promote public-private partnerships and provide legal support to foreign investors to help them navigate federal and state regulations, and to mobilize additional resources for the energy sector.
- **Empower the Directorate of Environment.** The FGS should transform the Directorate of Environment, currently at the Office of the Prime Minister, into a full-fledged ministry that has the political and legal clout as well as the resources to meaningfully lead on national environmental policies and strategies.
- **Create Annual Renewable-Energy Targets.** The FGS should set annual renewable-energy targets as well as annual price ranges for ESPs, and empower federal agencies to hold ESPs accountable to those targets. In doing so, the FGS would set clear benchmarks for ESPs and protect consumers from price hikes.
- **Prioritize Safety through Clear Standards.** Putting safety at the center of policymaking, the FGS should set clear standards that compel ESPs to share electric distribution networks and wiring of consumer houses to reduce the number of fires related to poor wiring. Similarly, the FGS should set standards for fuel imported into the country.
- **Develop Skilled, Local Labor through Training.** The FGS should establish technical and vocational education training (TVET) centers dedicated to the energy sector with the objective of creating a local skilled labor force that can support the sector. These centers should prioritize renewable energy.
- **Increase Public Awareness.** The FGS should launch a national public awareness campaign aimed at educating citizens about the severity of climate change and ways they can contribute to reducing the impact of climate change.

To the Federal Member States:

- **Establish Utilities Commissions.** Member states should establish state utilities commissions that can regulate and provide oversight to ESPs. These commissions should cooperate closely with the MEWR on policy alignment and strategy.
- **Set Standards and Prices.** Member states should cooperate with the FGS on setting clear standards and a price range for fuel and electricity, ensuring that the safety of citizens is paramount in all policies, while promoting overall access to clean electricity.
- **Provide Incentives.** Member states should promote renewable energy by providing catalytic resources to ESPs that meet federal and state targets. State incentives could include the provision of land for solar plants and wind farms, and agreed taxation frameworks to allow predictability for project investments.
- **Offer Training.** Member states should establish TVET centers to train the next generation of workers who can contribute to the growth of the renewable-energy sector.

To Electricity Service Providers (ESPs):

- **Integrate Networks.** ESPs should integrate their electric distribution networks in order to minimize duplication and maximize output. Parallel distribution networks are extremely inefficient and pose a safety hazard to citizens.
- **Pivot to Renewables.** ESPs should gradually reduce reliance on diesel generators and leapfrog to the use of solar photovoltaics, wind turbines, and other renewable-energy sources. These alternatives have proven to be both commercially viable and environmentally sustainable.
- **Collaborate on Regulations.** ESPs should collaborate closely with federal and state regulatory authorities for a common objective, which is to provide clean, safe, and affordable energy to Somalia's citizens.
- **Invest in Training.** ESPs should invest in local TVET programs that can train highly skilled labor for the energy sector.
- **Provide Customer Incentives.** ESPs should incentivize renewable energy to their customers by offering discounts and other perks that attract more customers and raise awareness.

ENDNOTES

1 Mission environmental action plans across UN peace operations are now tracked through an online platform known as the eAPP (Environment Action Planning Performance).

2 See World Bank, "Access to Electricity (% of Population) – Somalia," data as of 2019. https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?view=chart

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5 UN, *United Nations Secretariat Climate Action Plan 2020-2030*, September 2019, https://www.un.org/management/sites/www.un.org.management/files/united-nations-secretariat-climate-action-plan.pdf.

6 The activities of the UN Secretariat make up about 60 percent of the UN system's greenhouse gas emissions, and the largest share comes from UN-led peace operations. For a full discussion of the UN's commitments to renewable energy within its peace operations and meeting missions, see Victoria K. Holt, Alex Hopkins, David Mozersky, and Sherwin Das, *Shifting Power: Transitioning to Renewable Energy in United Nations Peace Operations* (Washington, DC: Stimson Center, January 2021), part of the Powering Peace series, https://www.stimson.org/2021/shifting-power-transitioning-to-renewable-energy-in-united-nations-peace-operations/.

7 See Office of the Prime Minister, "Updated Nationally Determined Contributions," accessed at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Somalia%20First/Final%20Updated%20NDC%20for%20Somalia%202021.pdf

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10 See Fund For Peace, "Failed States Index," https://fundforpeace.org/2013/06/24/failed-states-index-2013-the-troubled-ten/.

11 See BBC News, "Somalia Famine 'Killed 260,000 People,'" May 2, 2013, https://www.bbc.com/news/world-africa-22380352.

12 UN Security Council resolution 794, S/RES/794, (3 December 1992), https://digitallibrary.un.org/record/154648?ln=en.

13 Somaliland is larger.

14 Mark Mazzetti, "Efforts by CIA Fail in Somalia, Officials Charge," *New York Times*, June 8, 2006, https://www.nytimes.com/2006/06/08/world/africa/08intel.html.

15 UN Security Council resolution 1744, S/RES/1744, (20 February 2007), https://undocs.org/S/RES/1744(2007).

16 UN Security Council Resolution 1725, S/RES/1725, (6 December 2006), https://home.treasury.gov/system/files/126/1725.pdf.

17 For detailed understanding of the role of AMISOM, see Heritage Institute, "Exit Strategy Challenges for the AU Mission in Somalia," Paul D. Williams with Abdirashid Hashi (February 2016), http://www.heritageinstitute.org/wp-content/uploads/2016/02/Exit-Strategy-Challenges-for-the-AU-Mission-in-Somalia.pdf.

18 UN Security Council resolution 1863, S/RES/1863, (16 January 2009), https://undocs.org/S/RES/1863(2009).

19 These states are Galmudug, Hirshabelle, Jubbaland, and Southwest, along with Puntland. Benadir (the capital) is considered an interim federal territory, though its final status remains undetermined. Somaliland is seeking independence

20 AMISOM, "African Union, Federal Government of Somalia and partners start second phase of technical discussions on new AU mission in Somalia," February 2022, https://amisom-au.org/2022/02/african-union-federal-government-of-somalia-and-partners-start-second-phase-of-technical-discussions-on-new-au-mission-in-somalia/.

21 Government of Somalia, "National Environmental Policy," 2020, 2.

22 Interview with former official at the Office of the Prime Minister, Mogadishu, September 2021.

23 Ibid.

24 See Government of Somalia, "National Environmental Policy," 2020, 4.

25 Ibid.

26 See UN Humanitarian, "Somalia's Deadly Drought-Flood Cycle," UN Office for the Coordination of Humanitarian Affairs (OCHA), November 29, 2019, https://unocha.exposure.co/somalias-deadly-droughtflood-cyclenbsp.

27 The nationally determined contributions refer to each country's plans to reduce greenhouse gas emissions pursuant to the goals of the Paris Climate Agreement.

28 Interview with MEWR official, Mogadishu, September 2021.

29 Ibid.

30 Ibid.

31 See World Bank, "Access to Electricity (% of Population) – Somalia," data as of 2019. https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?view=chart ; and World Bank, "Access to Electricity, rural (% of rural Population) – Somalia," data as of 2019. https://data.worldbank.org/indicator/EG.ELC.ACCS.RU.ZS?view=chart&locations=SO

32 See page 434 of "Somalia Power Master Plan." (2017). Ministry of Energy and Water Resources of Somalia (MEWR). Accessed at: https://moewr.gov.so/en/projects/Energy_ongoing.

33 Ibid, page 17

34 Interview with MEWR official, Mogadishu, September 2021.

35 Traditionally dominant clans are Hawiye and Daarood. Since 2013, the ministry was consistently allocated to politicians from the Digil & Mirifle (aka Rahanweyn) clan, one of the four major clans of Somalia. Although large, the Rahanweyn are seen as politically less dominant than the Hawiye and Daarood.

36 Interview with former MEWR official, Mogadishu, September 2021.

37 Interview with MEWR official, Mogadishu, September 2021.

38 See page 39 of "Somalia Power Master Plan" (2017) by MEWR

39 Interview with MEWR official, Mogadishu, September 2021.

40 See pages 39-40 of "Somalia Power Master Plan' (2017) by MEWR

41 Ibid.

42 See The World Bank, "RISE 2016 – Regulatory Indicators for Sustainable Energy: A Global Scorecard for Policy Makers," 2017, https://www.worldbank.org/en/topic/energy/publication/rise---regulatory-indicators-for-sustainable-energy.

43 Interview with MEWR official, Mogadishu, September 2021.

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45 See U.S. Agency for International Development, "Somalia: Power Africa Fact Sheet," https://www.usaid.gov/powerafrica/wherewework/somalia.

46 Interview with MEWR official, Mogadishu, September 2021.

47 Interviews with executives of ESPs, Mogadishu and virtually, September-October 2021.

48 Interview with fuel trader, Mogadishu, September 2021.
49 Ibid.
50 Interview with former oil ministry official, Mogadishu, September 2021.
51 See page 434 of "Somalia Power Master Plan" (2017) by MEWR.
52 Interview with MEWR official, Mogadishu, September 2021.
53 See pages 39-40 of "Somalia Power Master Plan" (2017) by MEWR.
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55 Ibid.
56 Interview with former environmental official, Mogadishu, September 2021.
57 Interview with MEWR official, Mogadishu, September 2021.
58 Ibid.
59 See The World Bank, "$150 Million Electricity Recovery Project Aims to Help Light up Somalia."
60 Past efforts were made in Somaliland, but without success.
61 Interview with MEWR official, Mogadishu, September 2021.
62 See "Somalia Energy Sector Needs Assessment," by African Development Bank (2015). Accessed at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Final_Somalia_Energy_Sector_Needs_Assessment_FGS__AfDB_November_2015.pdf.
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65 Interview with BECO executive, Mogadishu, September 2021.
66 Ibid.
67 Virtual interview with Baidoa ESP manager, October 2021.
68 See "Somalia Economic Update 2021". Page 9. Accessed at: https://openknowledge.worldbank.org/bitstream/handle/10986/36312/Somalia-Economic-Update-Investing-in-Health-to-Anchor-Growth.pdf?sequence=1&isAllowed=y
69 BECO doesn't disclose its customer size; estimates are given by MEWR officials.
70 See Federal Government of Somalia, Ministry of Planning, Investment and Economic Development, *Somalia National Development Plan*, 2020-2024, 100, https://mop.gov.so/wp-content/uploads/2019/12/NDP-9-2020-2024.pdf.
71 Interview with MEWR official, Mogadishu, September 2021.
72 Interview with BECO executive, Mogadishu, September 2021.
73 UN Security Council resolution 2102, S/RES/2102, (2 May 2013), https://undocs.org/S/RES/2102(2013).
74 UN Security Council resolution 1863, S/RES/1863, (16 January 2009), https://undocs.org/S/RES/1863(2009).
75 UN Security Council resolution 2245, S/RES/2245, (9 November 2015), https://undocs.org/en/S/RES/2245(2015).
76 As reflected in the UNSOM budgets for 2020-2022. See A/74/6 (Sect. 3)/Add. 4, para. 80; A/75/6 (Sect. 3)/Add.4, para. 64; and A/76/6 (Sect. 3)/ Add. 4, para. 40.
77 In Somalia, the resident coordinator's office is typically referred to as the integrated office.
78 UN General Assembly, "Budget for the United Nations Support Office in Somalia for the period from 1 July 2021 to 30 June 2022 – Report of the Secretary-General," (16 February 2021), A/75/757, https://undocs.org/A/75/757, pp. 3. Summary, states: "The proposed budget provides for the deployment of 10 United Nations military personnel, 18,586 AMISOM military contingent personnel, 240 AMISOM police officers, 800 AMISOM formed police personnel, 368 international staff, 189 national staff, 20 United Nations volunteers and 6 government-provided personnel."

79 UNSOS EIMP, section 2.3.
80 Interview with UN officials, September 9, 2021.
81 UNSOS EIMP, section 1.2.
82 Interview with UN official, September 15, 2021.
83 UNSOS EIMP, section 1.2.
84 Interview with UN officials, September 2, 2021.
85 UN official, email to authors in response to written questions, October 1, 2021.
86 UN Office of Internal Oversight Services, Internal Audit Division, "Audit of Management of Troop/Police Personnel and Equipment Contribution in UNSOS," 2020/049.
87 Interviews with UN officials, September 2, 2021, and September 13, 2021.
88 The Security Council further specified that equipment gifted or donated to the African Union, AMISOM, or its troop-contributing countries, or where ownership remains with the providing country, would not be eligible for reimbursement.
89 UN General Assembly, "Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions," A/72/288, (4 August 2017), https://undocs.org/a/72/288.
90 Interview with UN officials, September 2, 2021.
91 Interview with UN officials, September 13, 2021.
92 Fuel for generators is budgeted under the Facilities and Infrastructure category of expenditure, while fuel for vehicles is budgeted under the Ground Transportation category of expenditure.
93 Interview with UN official, September 15, 2021.
94 UN Office of Internal Oversight Services, Internal Audit Division, "Audit of Fuel Management in UNSOS," 2019/100.
95 Interview with UN official, September 15, 2021.
96 Rodney Muhumuza, "Uganda Arrests Somalia Peacekeepers over Theft," AP News, October 29, 2013.
97 BBC News, "African Union Soldiers Jailed over Somali Fuel Racket," August 16, 2016.
98 Ibid.
99 UN General Assembly, "Activities of the Office of Internal Oversight Services on peace operations for the period from 1 January to 31 December 2019 – Report of the Office of Internal Oversight Services," A/74/305 (Part II), (19 February 2020), https://undocs.org/en/A/74/305(PartII).
100 Interview with UN officials, September 15, 2021.
101 See, for example, Holt, Hopkins, Mozersky, and Das, Shifting Power.
102 UN official, email to authors in response to written questions, September 19, 2021.
103 UNSOS EIMP, section 3.7.
104 Interview with UN officials, September 15, 2021.
105 UN official, email to authors in response to written questions, September 19, 2021.
106 Interview with UN officials, September 14, 2021.
107 Interview with UN officials, September 15, 2021.
108 UNSOS EIMP, Appendix A.
109 Interview with Kube Energy, January 19, 2022.
110 Interview with UN official, September 23, 2021.
111 Interview with UN officials, September 15, 2021.
112 Technically, the decision-making standard for the Fifth Committee is the "broadest possible agreement", as established in UN General Assembly resolutions 41/213 and 49/143.

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BACK COVER
Ugandan soldiers serving under the United Nations Guard Unit, on parade during the handing over ceremony held in Mogadishu, Somalia on July 25, 2019. *UN Photo/Ilyas Ahmed*

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