# Peace Renewable Energy Credits

## Facilitating High-Impact Projects in Fragile Regions


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**ON THE COVER**

A tent camp housing thousands of Somali immigrants, taken on April 30, 2013, in Mogadishu, Somalia. Photo: Sadik Gulec.

# Introduction

Over 135 million people worldwide are in need of immediate humanitarian assistance, including 68.5 million people displaced.[1] At the same time, climate change is having an increasing impact on violent conflicts, compounding global humanitarian and security challenges. Record numbers of refugees from these conflicts are stretching resources, and global institutions are struggling to respond. There is strong overlap between countries at greatest risk of conflict, those most vulnerable to climate change, and those with the highest levels of energy poverty.

The 27 countries highlighted in Figure 1 are the ones most acutely affected by this triple threat. The existing toolkit to address conflict is limited, and international approaches have not sufficiently accounted for the interconnected dynamics of climate change, conflict, and energy poverty. Renewable energy, however, represents a unique tool to reduce emissions, provide electrification benefits, and support peace and development.

Many of those displaced by conflict or climate impacts end up living in relief camps where approximately 90% of people do not have access to electricity.[2] This lack of electrification in many conflict-affected and fragile states affects all sectors of society, including health, education, and enterprise, and hinders overall socioeconomic development. While investment in renewable energy globally has grown significantly in the last decade—hitting nearly $334 billion in 2017—these fragile states are largely missing out on this growth. The limited electrification in most international humanitarian and peace field operations, including relief camps, comes almost exclusively from diesel generators, with an estimated $1.2 billion spent annually by humanitarian agencies on diesel and related generator costs.[3] Providing electricity is among the largest expenses for humanitarian missions, as many missions operate in remote and hard-to-reach places with long fuel supply lines that drastically increase overall costs. Moreover, overland fuel transport through insecure conflict areas poses serious risks, while

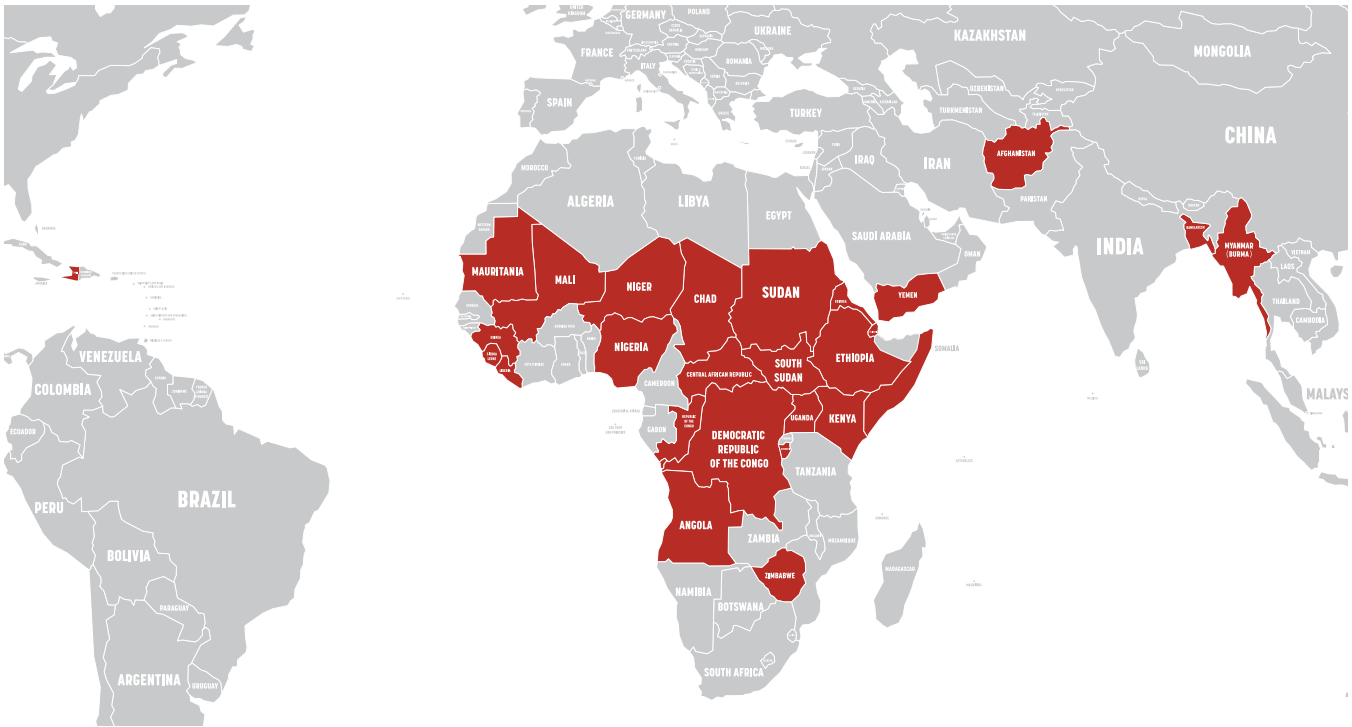



**FIGURE 1:** MAP OF COUNTRIES AT GREATEST RISK OF CONFLICT, CLIMATE CHANGE, AND ENERGY POVERTY

local diesel supply chains are often commingled with war economies.

Renewable energy in these locations offers a unique opportunity to deliver multiple benefits, including cost savings, pollution reduction, improved electricity access, and economic development opportunities. For example, in Jordan, new solar plants for two major refugee camps are producing annual savings of $7.5 million for the United Nations High Commissioner for Refugees. These plants are relieving pressure on the host country's national electricity grid and can remain an asset that stays with local communities for decades.[4] However, many existing peace and humanitarian operations are in places with limited energy infrastructure and investment incentives, since conflict- and crisis-risk areas generally lack the financing mechanisms and investment vehicles that support renewable energy growth elsewhere. Although renewable energy represents roughly 75% of global climate finance, investment is focused overwhelmingly on the worst-polluting countries rather than the ones most affected by crises.[5]

To address this gap, the Peace Renewable Energy Credit (PREC) was developed by Energy Peace Partners to encourage new clean energy investment by monetizing renewable energy attributes generated in fragile states, with an initial focus on humanitarian and peace operations. Existing renewable energy certificate (REC) markets have contributed to stimulating renewable investment globally, and the PREC will extend these markets to some of the world's most vulnerable places, delivering additional pro-peace co-benefits associated with new clean energy assets in conflict and crisis settings. PREC-supported energy systems have the potential to significantly decrease energy costs for international missions and local communities, advance the UN's Sustainable Development Goals, introduce new renewable energy infrastructure, and better align the values of international humanitarian donors by extending green commitments to foreign aid spending.

PRECs are intended to help create long-lasting clean energy assets that can serve as building blocks for peace and development in the post-conflict phase by increasing energy access, encouraging follow-on investment, creating new revenue streams, seeding local businesses, and creating jobs. PRECs could ultimately create momentum for a sector-wide shift towards the integration of climate solutions with peacebuilding, involving both the public and private sectors.

For PRECs to be successful, there must be sufficient demand for them. This paper assesses the market feasibility of PRECs through the lens of existing renewable energy markets. It includes a summary of renewable energy markets and drivers of demand, the impact of voluntary REC markets on the growth of the renewable energy sector, the potential for PRECs to bridge existing funding gaps, and a final discussion of future opportunities and market considerations to support PREC adoption.

# Renewable Energy Markets and Demand Drivers

In 2017, total global installed renewable energy capacity of non-hydro renewable energy surpassed 1,152 gigawatts (GW), with 146 GW of new renewable energy additions occurring in 2017 alone.[6] According to the International Renewable Energy Agency (IRENA), an intergovernmental organization that supports countries in transitioning to clean energy, 85% of new renewable energy capacity additions have come from solar and wind, with Asia dominating the global solar capacity expansion with a 72 GW increase. Three countries accounted for most of this solar growth, with increases of 53 GW (+68%) in China, 9.6 GW (+100%) in India and 7 GW (+17%) in Japan. Other countries that installed more than 1 GW of solar in 2017 include Australia, Brazil, Germany, South Korea, Turkey, and the U.S. Much of the growth of onshore wind and solar has been propelled by the falling levelized cost of energy (LCOE) by 67% and 86% respectively since 2010.[7]

## Policy and Financial Incentives

National, subregional, and municipal governments around the world have successfully employed a range of policy tools to help catalyze demand for renewable energy within their jurisdictional boundaries. Most common among these drivers are energy policy tools such as feed-in tariffs (FITs), renewable energy quotas or renewable portfolio standards, preferential rates/tariffs, auctions, and tax incentives. Carbon policy instruments such as cap-and-trade systems, emissions mandates, and carbon taxes are often beneficial in shifting the power sector toward increased renewable energy deployment.

## SOUTH SUDAN

South Sudan became the world's newest independent country in 2011, but economic and political progress quickly stagnated. Things worsened when a new civil war began in late 2013, pushing it to the top of the Fragile States Index.[21] Despite being an oil producer, South Sudan remains the least electrified country in the world. What little electricity the country generated—only 22 MW of capacity before the civil war began—came entirely from diesel and heavy-fuel generators. The lack of electrification impacts all sectors of society, with government offices and hospitals often facing regular blackouts. Due to the civil war, there remain UN-guarded protection of civilians (POC) sites for internally displaced people (IDPs) in several major cities.[22]

For example, in the regional capital of Malakal, roughly 30,000 IDPs are housed in a relief camp protected by UN peacekeepers (see photos below); the humanitarian operations are powered by diesel fuel. For most of the last five years the diesel has been shipped in by air because of insecure road and river access, with the camp spending approximately $1 million annually on power costs. Across non-conflict areas of East Africa, diesel generators operate on a LCOE[23] of $0.50 to $2/kWh, while solar-plus-storage solutions range from $0.40 to $1/kWh.

Installing new solar photovoltaic systems would reduce local pollution and fuel transportation hazards, while reducing fuel costs significantly and building new energy infrastructure. It has been estimated that the associated reduction in diesel expenditures would pay back the solar investment in Malakal within three years.[24]

While many developed economies are increasing renewable energy capacity, a number of the regions worst affected by conflict and climate change remain unable to fully realize the benefits of renewable energy due to the lack of support from national governments, the priorities of international climate finance, and limitations in funding dynamics for fragile states. Conflict- and crisis-risk areas, for example, are often beset by governance challenges, and clean energy or carbon policy is not a priority. International climate finance is available to some, but the emphasis is on the most polluting countries rather than those most affected, and these mechanisms tend to require strong local governmental partners as the entry point.

Moreover, for the worst-affected populations receiving emergency aid, the lack of electrification further complicates the work of humanitarian and peace missions that need energy to power their most essential operations, including medical care, lighting, communications, and security. In most cases, this means reliance on expensive diesel systems—an estimated $1.2 billion was spent by these humanitarian organizations in 2017 to power and supply diesel generators and related energy sources.[8]

Although violent conflicts and their impacts can persist for many years, most humanitarian crisis operations are dependent on short-term 12-month funding cycles, even in protracted long-running crises. Financing the high up-front costs of renewable energy systems—even when cost savings can be realized in three to five years—is typically not an option. This short-term dynamic reinforces the continued reliance on diesel generators and does nothing to break the cycle of energy poverty in these fragile regions. Since policy-driven solutions may not be possible in fragile settings such as these, market-driven solutions—specifically modeled on the success of renewable energy certificate markets in the U.S.—could advance renewable energy deployment in these areas.

# Voluntary Renewable Energy Markets

In addition to government-sponsored policy and legislative mandates, private entities are also moving forward with renewable energy commitments. This "voluntary market" for renewable energy is made up of residential customers, universities, NGOs, cities, small and mid-size corporations, and significantly, global multinational companies. Voluntary markets comprise renewable energy purchases above and beyond the requirements of government mandates, and reflect consumer preferences in renewable energy purchasing.

Demand from voluntary commitments has risen sharply over the last five years and is driven by greenhouse gas management, corporate social responsibility goals, and the economics of renewable energy. A 2018 IRENA report found that corporate sourcing of renewable energy occurs in 75 countries, and one in five corporates has a renewable energy target.[9] While the majority of these companies are located in the U.S. and EU, demand for renewable energy is increasing among corporates in Africa, Asia Pacific, Latin America, and the Middle East. As of September 2018, 152 companies had made 100% renewable energy commitments through RE100, an initiative of CDP and The Climate Group—up from 87 in 2016.[10] This increasing demand—and supply built to meet it—shows how voluntary markets are proven and effective tools to increase renewable energy deployment.

In the United States, voluntary corporate renewable energy procurement has been a major driver of new renewable energy development. The American Wind Energy Association reported that 52% of all wind energy power purchase agreements (PPAs) executed in 2015 were with non-utility purchasers, up from 22% in 2013. Since 2015, over 140 unique corporate PPA deals have been completed, accounting for over 12.7 GW of new capacity additions[11]—equivalent to nearly twice the generating capacity of the state of Alaska. As of May 2018, global corporate sourcing of renewable energy reached a total of 465 terawatt-hours (TWh), largely consisting of production for self-consumption (165 TWh) and unbundled RECs (130 TWh).[12]

## Renewable Energy Certificates

The success of voluntary markets and their associate products is facilitated by the use of energy attribute certificates, including RECs. RECs are an important tool in both compliance markets (where a renewable portfolio system [RPS] or quota system may be in place) and voluntary markets to verify ownership of the non-power benefits associated with renewable energy generation and allow for renewable energy usage claims. In many countries around the world, for every MWh of renewable electricity that is added to the grid, a form of REC is created,

which can be tracked and traded separately from the underlying electricity—including Guarantees of Origin in Europe and *Certificados de Energías Limpias* (Clean Energy Certificates) in Mexico.

RECs represent a buyer's right to claim that they are using renewable energy and are an essential accounting tool for renewable electricity markets. Whether the product is bundled (includes RECs and electricity) or unbundled (only includes RECs, without electricity), all product types require RECs to prove delivery to customers.

Electronic tracking systems are typically used to issue, track, and retire RECs, helping to ensure credibility and ease verification in REC markets. Every MWh is tracked with a unique serial number, and specific data for each certificate is included within the tracking system such as vintage, resource/fuel type, project location, capacity, and facility online date. Best practices regarding meter data and verification protocols must be followed to maintain the credibility of the instrument.[13]

For voluntary markets to be effective, they need:

1. **Real delivery of attributes.** RECs are not tangible commodities, so it is necessary to verify that what is promised to customers is actually delivered. While non-power attributes can be transferred by supply contracts, it is best practice to serialize these attributes into RECs and use tracking systems or registries to facilitate transfer of ownership.
2. **Consumer confidence.** It is essential that customers are confident in their purchase of renewable energy and that their purchase has impact. The use of RECs, tracking systems, independent verification, auditing, and certification assist with providing assurance and credibility to transactions.
3. **Protection against double counting/double claiming.** Individual RECs should only be counted and claimed by a single customer. There is ongoing need to ensure the value and ownership of the REC is preserved.
4. **Regulatory surplus.** RECs for voluntary customers should be additional to any government mandate or legal settlement. For example, RECs that are being used by a utility to meet a quota or legislative requirement should not be available or used for voluntary markets or claims.
5. **Products that meet customer needs.** Voluntary market customers differ in their expectations and requirements for REC-based products. While some purchasers are driven by sustainability or climate efforts, others are driven primarily by the financial benefits (including cost savings and long-term fixed prices). Effective markets can address the needs of different customers through different procurement options.

## Renewable Energy Procurement Models

Renewable energy purchasing options are expanding rapidly. These options are typically more diverse as electricity markets become more liberalized. Demand tends to be greater in markets where environmental benefits are coupled with financial benefits. Examples of renewable energy product offerings include:

- **Unbundled RECs.** RECs that are tracked and traded separately from the underlying electricity. RECs represent one's right to claim that they are using renewable energy and are the most widely used method for corporate sourcing of renewables. Examples include RECs, GOs, CELs, and Green Certificates (China).
- **Utility options.** Utilities sell power and bundled RECs to a customer in the form of a green tariff (a bilateral contract where the buyer can specify the product requirements) or a monthly enrollment in the utility's green power program.
- **Power Purchase Agreements.** A contract between a buyer and a specific renewable energy project that is typically at a cost-competitive price. Physical PPAs are for physical delivery of renewable energy and typically the RECs are bundled with the electricity. PPAs have geographic restrictions because the buyer takes physical delivery of the energy. Virtual PPAs (VPPAs) allow corporations to pay a fixed price for the energy while not taking physical delivery, but retaining the RECs. Increasingly, new PPA models are providing additional procurement options for small and mid-sized corporate customers, an industry trend that is expanding market access and increasing ease of adoption.
- **Self generation.** In some cases, the corporation will invest in, host, lease, or own renewable energy generation to help power its operations. Typically this is done onsite at owned or leased

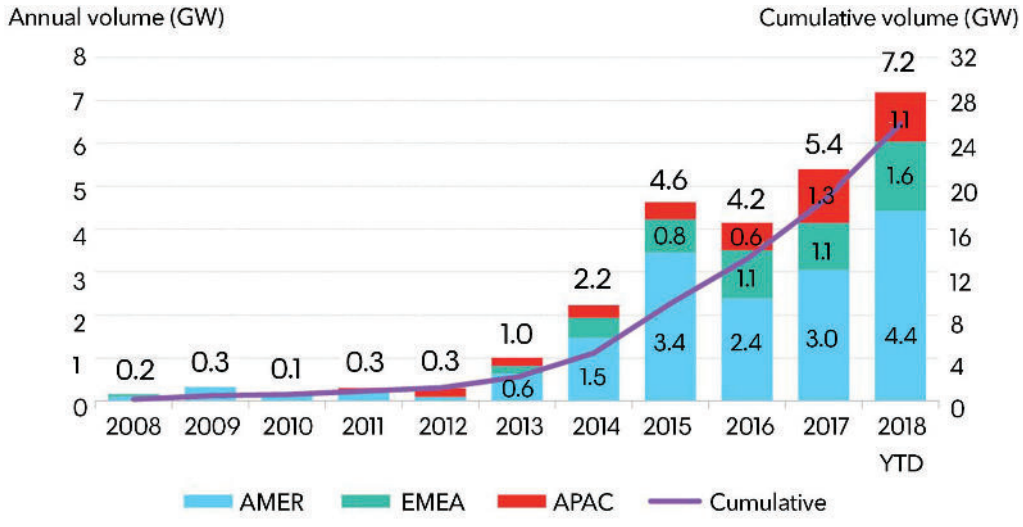
## PPAs AND VPPAs EXPLAINED

Power Purchase Agreements (PPAs) have become an attractive option in the last few years because they allow corporates to meet their sustainability goals, lock in a cost-competitive price, and in most cases, help directly finance new renewable energy projects. There are two main types of PPAs:

**Physical PPA.** A traditional, or physical, PPA is a contract between a corporate consumer and a developer to pay a fixed price for the electricity and RECs. The RECs are generally bundled with the electricity, so the location of the project must be in the same grid region as the corporate operations. In this case, the corporate consumer is claiming both physical delivery of the electricity and the RECs.

**Virtual PPA (VPPA).** In a VPPA, the buyer still pays a fixed price for the energy and RECs, but is not taking physical delivery of the energy and only retains ownership of the RECs. The developer will sell the energy into the wholesale spot market (the real-time market for immediate delivery), and receive the market price for the null power—electricity without a REC attached that therefore has no environmental benefit.[25] If the market price is above the VPPA fixed price, the developer pays the buyer the difference. In contrast, if the market price is below the fixed VPPA price, then the buyer pays the developer the difference. Also called a "contract for differences," this arrangement is more flexible than a traditional PPA, and it does not have the rigid location requirements. The VPPA enables the project to secure project financing by guaranteeing revenues and acting as a hedge against increasing electricity prices (both upside and downside risk is transferred to the buyer). Both cases are a win-win scenario that help drive additional renewable capacity

**FIGURE 2:** GLOBAL CORPORATE PPA VOLUMES, BY REGION




*Source: Bloomberg NEF. Note: Data is through July 2018. Onsite PPAs not included. APAC number is an estimate. Pre-market reform Mexico PPAs are not included. These figures are subject to change and may be updated as more information is made available.*

AMER: North, Central and South America; EMEA: Europe, the Middle East and Africa; APAC: Asia Pacific.

facilities, but can also be located offsite and connected to the local grid.

## Voluntary Market Procurement Trends

As recently as several years ago, buying unbundled RECs was not only the most convenient and flexible way of buying renewable energy, for many corporations it was the only feasible option. Today however, prices for clean energy technology are on the decline, more procurement options are available, and corporations are interested in increasing their impact as much as possible.

Among forward-thinking corporations, there is a desire to have their renewable energy procurement lead directly to new renewable energy generation and have greenhouse gas emissions avoidance benefits. Where REC-only purchases are made, many organizations prefer to select from projects that may be local, use a particular technology, or carry community or social benefits.

Additionally, market participants increasingly favor product options that help them achieve long-term cost savings and price stability, such as utility green tariffs or VPPAs. This contrasts with short-term REC-only products that may carry an ongoing premium. A notable trend in corporate sourcing from 2016–2017 was the twenty-fold increase of electricity purchases directly from an offsite generator, instead of through grid-connected projects.[14] Many purchasers also prefer or require renewable energy that helps them meet specific program and reporting goals, such as CDP, RE100, and Green-e Energy certification.

A number of companies participating in RE100 and other commitment programs have operations in countries that don't have existing voluntary market infrastructure, or their small electricity footprint makes it harder for them to negotiate favorable terms. Doing business in these countries can be challenging for corporations used to operating in developed markets. In these situations, some corporations have expressed a distinct interest in aggregating their electricity loads by region (e.g. Africa, Southeast Asia) and identifying a single large project or portfolio of projects to match their demand.

Alternatively, some corporations have entertained supporting projects that have significant social and environmental value. Several RE100 members are also members of Business for 2030, a group of businesses committed to advancing the UN's 2030 Sustainable Development Goals. It is clear that the desire for positive social impact from many corporations is present in the market, but tools are still needed to help them realize their climate and energy goals.[15] The increased willingness to support smaller, non-traditional, high social impact projects is an encouraging trend that supports the adoption of PREC projects.

# Peace Renewable Energy Credits

Peace Renewable Energy Credits are a new variant of traditional RECs that denote the environmental and social attributes associated with renewable energy generation from projects located in fragile settings, including conflict affected areas and humanitarian missions. PRECs traded on the voluntary market will monetize renewable energy generation in these settings. This can create a new revenue stream that is additional to the cash flow from the sale of electricity and savings from diesel purchases and transportation. At the same time, it can decrease risk, increase financial incentives, and shorten payback periods for solar investors and developers in challenging markets.

While there are many market players that drive demand for RECs globally, including governments, electricity suppliers, and individuals, corporations are a significant driver of REC markets and the market player most likely to drive demand for PRECs.

Sales of PRECs can promote the building of new renewable energy systems that replace or supplement diesel-powered systems in fragile settings. PRECs will be issued by Energy Peace Partners under the International REC (I-REC) Standard, an internationally recognized standard and tracking system that provides a measure of assurance that for every one megawatt hour of renewable energy generated, one PREC has been created and registered.

## Social and Environmental Co-Benefits

Based on the circumstances in which PRECs are generated, they will carry with them many non-power social and environmental benefits including:

**Local benefits.** The introduction of new renewable energy projects in fragile settings can offer both immediate and longer-term benefits in conflict-affected, climate-vulnerable, and energy-poor settings. First, new generation capacity supports new electrification and improved local energy access. Second, reducing diesel dependance has obvious environmental benefits, including cleaner air and reduced pollution. Third, renewable generation can have security benefits, by reducing reliance on local diesel procurement, which in conflict settings can have supply chains that intersect with the war economy. Furthermore, it can help reduce the need and frequency of long-distance fuel convoys for remote sites, which is currently one of the greatest security threats facing United Nations peacekeeping missions. Finally, it creates future peace dividends and new assets for consolidating peace and development.

**Climate benefits.** Most renewable energy sources produce zero carbon emissions during operation. While this lack of direct emissions is helpful in reducing greenhouse gases from the electricity sector, it becomes even more beneficial when renewable energy can replace high carbon sources, such as diesel generation. PREC projects that replace existing diesel generation will be helping to avoid 22.4 pounds[16] of carbon dioxide emissions for every gallon of diesel fuel burned.

**Peace benefits.** Investment in renewable energy systems located in fragile settings helps support local and national development and peace building in different ways, and PRECs can play an important role in facilitating these projects. The overall contribution that renewable energy can make towards peace and stability is context-specific, but there are commonalities of overwhelming energy poverty, combined with the presence of large diesel-powered humanitarian and peace missions in countries like Central African Republic, Democratic Republic of Congo, Mali, Somalia, and South Sudan, in which new renewable energy projects would provide great benefit. Some examples of the potential peace benefits of renewable energy projects include:

- **South Sudan.** The IDP camp in Malakal, South Sudan is situated three kilometers outside of the former regional capital, which has been destroyed in the country's long-running civil war. Transitioning the humanitarian operations in the Malakal camp from its current reliance on expensive air-lifted diesel to a large solar/battery system would offer immediate benefits and cost savings for the humanitarian efforts. The project would entail building a new solar photovoltaic system in the camp to support the humanitarian operations. Much of the displaced population living in the camp will eventually return to Malakal town when peace comes. Building this system today would allow it to serve as the utility of the future for Malakal, and offer an entry point for peacebuilding and local cooperation between

## RENEWABLE ENERGY REPORTING PRACTICES

Guidance for greenhouse gas accounting (largely from WRI), renewable energy usage claims (e.g. through RE100), and other reporting or certification protocols (e.g. CDP, Green-e) have been developed through public and private stakeholder consultations to provide guidance to global voluntary market participants. Current guidance from these groups may need to be amended or clarified to better capture the customer benefits of projects using PRECs. While making claims of renewable energy "usage" based on PRECs may not currently be allowed for entities that do not have operations within the market boundary, the opportunity exists for corporate GHG and renewable energy recognition programs to expand their guidance and allow for PRECs to count toward certain initiatives through an alternative compliance path, which could significantly increase the value to the buyer.

WRI's guidance points to entities such as government regulators and certification programs to determine market boundaries. Typically, these entities (such as Green-e) define market boundaries as representing the same country or connected grid region. The RE100 Steering Committee has discretion to grant exceptions for alternative claims or rules if there are companies participating in their campaign that are prevented from procuring renewable energy in the same country or market as their operations.

communities on opposite sides of the ongoing civil war.[17]

- **Democratic Republic of the Congo.** The Virunga National Park in DRC has received a boost in recent years by the construction of several new hydroelectric dams, which power local industry and distribute energy to the neighboring communities. Located in conflict-ridden eastern Congo, the new energy project is designed to reduce the need for illegal logging for charcoal, create jobs, and reduce the economic drivers behind poaching, which threaten the park.[18]
- **Middle East.** An ambitious solar/water desalination project between Jordan, Israel, and Palestine seeks to support peace by increasing the interdependence of these three neighboring countries that have survived generations of conflict. The vision is for large solar projects in Jordan to power desalination plants in Israel, with clean water exported to Palestine, which has some of the highest water-scarcity rates in the world.[19]
- **Lebanon.** The Lebanese government recently signed its first wind power PPA with the private sector. Technical work related to land rights acquisition helped spur an agreement between local communities in northern Lebanon on a long-disputed land border, demonstrating the confidence-building potential of new renewable energy development.

**Customer benefits.** Similar to RECs, PRECs confer non-power environmental benefits, including reduced greenhouse gas emissions and local pollution benefits. Under current global guidance, corporate purchasers could claim to be supporting renewable energy projects and helping to build a market for renewable electricity in the region of generation. The added value of the PREC is the ability of its purchasers to contribute to the aforementioned local, global, and peace benefits. Each PREC-supported renewable energy project will have a different level of impact. This aspect will allow buyers to choose projects in closest alignment with their specific organizational goals, as well as create an opportunity for buyers to make a unique and lasting impact in regions that need renewable investment the most. It also makes for a compelling narrative. Given some of the acute social and environmental benefits of renewable energy use in PREC projects, some purchasers may also tout the peacebuilding benefits in their marketing and branding. In line with a growing corporate appetite for accelerated impact, an additional benefit the PREC offers is an option to address multiple corporate social responsibility goals with a single purchase. Some companies may choose to match PRECs to existing regional electricity loads to support RE100 goals, particularly in those local or regional markets without established REC systems.

**Financial benefits.** PREC projects present opportunities beyond the claim of renewable energy usage. These projects can be a vehicle for investment, aid in the recovery of capital costs, and would provide a contracted revenue stream.

## Bridging the Funding Gap

Both peacekeeping and humanitarian aid missions are generally dependent on short-term funding cycles. This precludes capital investment in new renewable energy systems, which tend to be more expensive than diesel generators as one-time upfront purchases, but pay back their costs over time. While private-sector investment has helped enable renewable energy growth across the globe, it can be difficult for international humanitarian missions to make multi-year leasing commitments. PRECs can help bridge this gap by offering a long-term way to monetize the renewable energy generated by projects in fragile settings, thereby helping to create the economic conditions necessary for investment.

In projects registered to issue PRECs, the owner of the generation will be able to sell the PREC to entities wishing to make a claim on the environmental and peacebuilding benefits associated with the generation from the project. The seller will no longer be able to make claims on the non-power benefits of the generation, but in exchange, will receive revenue that may be reinvested into new projects.

PPAs and VPPAs are incredibly useful in driving forward global voluntary markets. This model is familiar to leading corporate purchasers, and the PREC offers a way to open up new markets to VPPAs. For example, this model could potentially be used to secure a long-term financial hedge against electricity price increases in a region while delivering PRECs to the VPPA offtaker.

## RE100 FOR THE UNITED NATIONS?

Total greenhouse gas emissions for UN facilities and operations in 2016 amounted to 1.9 million tonnes of $CO_2e$, with over 55 percent of emissions stemming from field missions, including refugee camps.[26] To combat this, the entirety of the UN system has committed to reaching 100% climate neutrality by 2020.[27] Individual UN entities have already demonstrated their environmental commitments through the gradual rollout of energy conservation programs, low-tech solar projects, and the purchase of carbon offsets, but there is still more work to be done to reach the 2020 goals. The purchase of RECs and carbon offsets could facilitate this goal, but it remains an unpopular option, as every REC or offset purchased is money taken away from other UN operations, including operating refugee camps. In an effort to reduce its own carbon footprint, the United Nations is developing a new approach through UN-Electric.

UN-Electric is an emerging multinational public-private partnership focusing on:

1. **SDG7 support for 50 countries.** The primary focus is on delivering on the ground support to up to 50 priority UN Member States in achieving Sustainable Development Goal 7 (affordable and clean energy). The geographic focus is on countries, territories, and subnational regions that face a particularly difficult energy access challenge and remain highly reliant on fossil fuels for power generation. This diverse group includes small islands and least-developed, in-conflict, post-conflict, and post-disaster states and regions. Prioritization within this group is based on demand and where the special status and capacity of the UN can provide the greatest added value.
2. **Electrical engineering infrastructure.** The technical focus is on the generation, distribution, storage, and productive use of electricity at the engineering infrastructure scale. This definition covers power generation plants, national, subnational, and city scale electrical grids, alternating current mini-grids, and substantial off-grid systems. This is where the greatest gap in support to the priority countries is noted.
3. **UN RE 100.** A parallel focus area is supporting the United Nations itself to complete its own energy transition by 2030, in a manner that also generates sustainable development benefits for the 50 priority countries. This will require the UN to review its approach to energy, upgrade its infrastructure and catalyze several hundred private sector renewable energy projects that can then sell electricity to UN facilities.

The UN-Electric approach can bridge the gap between the UN's Sustainable Development Goals, fragile state economies, and renewable energy markets. Compliance with this internal target could help support the procurement of PRECs to match the electricity usage associated with their field missions and other operations. In addition, renewable energy projects developed within UN operational boundaries could help reduce emissions associated with the replacement of diesel generation.

## PRECs as an Instrument for Market Development

Fragile regions have many urgent development and stabilization challenges that new renewable energy projects can help address. PRECs can advance new renewable energy projects in these regions by leveraging demand in existing voluntary markets, adding credibility to projects, quantifying non-power benefits, and attracting non-traditional investors (including large multinational corporate purchasers). They can also catalyze new discussions around energy procurement from the UN and other multilateral institutions, and international development agencies operating in fragile states.

**Leveraging existing markets.** Voluntary markets and REC-based instruments have existed for decades and are widely accepted. However, these voluntary markets mostly function in developed economies and grid-connected regions. The creation of a PREC leverages existing procurement models (e.g. unbundled RECs, VPPAs) that are familiar to many existing corporate purchasers, in new and high-impact settings. These projects potentially satisfy corporate demand for more impactful, "charismatic" renewable energy procurement options. Regardless of where the PREC purchaser is physically located, the transaction of a PREC can support renewable energy projects in the region of generation and help drive the local market for renewable electricity.

**Adding credibility to projects.** Similar to RECs, the PREC will be used as a credible accounting instrument to represent a claim on the non-power benefits of renewable electricity generation. Each PREC will contain specific information about the resource type, location of generation, vintage of generation, project type, and a unique certificate number that can only be claimed once. The ability to independently verify the data associated with the project will facilitate quality assurance.

**Quantifying non-power benefits.** Most potential renewable energy projects are assessed from a primarily financial perspective, requiring the technology to achieve price parity or better with incumbent generation technologies such as coal, natural gas, fuel oil, and diesel. RECs help to capture and value the non-power benefits. PRECs can further incorporate the social and environmental benefits associated with renewable energy projects in fragile regions and conflict areas. The valuation of these non-power benefits increases incentives for new project development in these regions.

**Opening opportunities for off-grid and social-impact projects.** Voluntary markets for renewable energy are growing and flourishing in developed economies using RECs generated from grid-connected projects. The creation of RECs from off-grid projects has not traditionally been encouraged in guidance offered by Green-e, RE100, and WRI. However, recent discussions with standard-setting organizations have indicated a willingness to examine mechanisms to support projects outside of the electricity market in which large corporate purchasers have operations. These include high-impact and off-grid projects such as those represented by PRECs which can be generated from projects that would help support humanitarian or peace operations in fragile settings, creating new opportunities for peace building and stabilization. Energy Peace Partners is developing several approaches for measuring the contributions of renewable energy to peace building in these fragile settings.

REC markets have not yet developed in Africa, with limited exceptions. However, RE100 companies have operations in many African countries, including Algeria, Angola, Cameroon, Democratic Republic of the Congo, Egypt, Ethiopia, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Libya, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe.[20] Support for PREC projects in Africa could allow companies with operations on the continent to support renewable energy projects in fragile areas if new parameters for renewable energy usage claims or market boundary exceptions can be approved. It may also contribute to the growth of the larger REC market on the continent.

**Attracting new and non-traditional investments.** PRECs offer an important new way to link existing renewable energy markets with fragile states. PRECs represent a virtual commodity that holds value and is in demand by large corporate REC buyers—the claim to one MWh of clean energy, plus additional co-benefits. PRECs also have the additional advantage of being generated from projects in settings where little foreign investment usually occurs, outside of resource extraction. As there are still no operational REC frameworks in many parts of the world, including across Africa, there is no easy way for corporate or governmental REC buyers

to purchase clean energy in these regions through the voluntary market. A U.S.-based corporate PREC buyer, for example, would receive the renewable energy attributes from a project while providing an additional revenue stream to help get that project built, expanded, and/or maintained in a locale that might otherwise discourage investment.

Energy is a largely ignored issue in international missions in fragile states—there is little data available on energy usage, expenses, and needs in such missions, and little understanding of the infrastructure outside of the site engineers and logisticians. The PREC offers a new hook to help raise awareness and open up new conversations about the role of energy in conflict and crisis countries, and the vast potential benefits of renewable energy.

# Opportunities for PREC Adoption

As global voluntary markets for renewable energy grow, PRECs are poised to fill a unique role in improving access to meaningful procurement options. In conflict zones and fragile regions without existing REC markets, projects generating PRECs may represent a viable and credible pathway for purchasers to support procurement with high social-impact benefits. Those interested in supporting these projects could include:

**Multilateral institutions and NGOs.** Organizations such as the UN that have operations in these regions and currently rely overwhelmingly on diesel generators could take a more active role in leveraging local funds to facilitate these projects, which are consistent with their local aid and development efforts. These actions could help provide tangible and lasting benefits to the communities they serve.

**Corporations.** Multinational corporations with global operations may represent the clearest target for PREC projects as the number of public renewable energy commitments like RE100 grows. Many corporations have operations in dozens of countries, with many countries not having credible REC markets and corporates having relatively low electricity usage within those countries. As such, many corporations have begun to take a regional approach to renewable energy procurement.

While renewable energy accounting guidance provided by CDP, RE100, and WRI clearly indicates a market boundary approach, there may be some corporations willing to support projects within a region whose electricity markets don't clearly overlap. Unilever, for example, has operations in Kenya and Tanzania and has expressed a willingness to support renewable energy in the region. Google has also shown a willingness to take an alternative approach by matching total global renewable energy purchases to electricity load, while being explicit in its communications that a lack of viable options limits its ability to purchase renewable energy in certain regions.

Indeed, WRI Scope 2 Guidance and RE100 rules are currently limited in their instructions for regions in which no common market or instruments exists. Acknowledgement of the applicability of PRECs in these scenarios by such organizations and reporting protocols could further the market adoption of PRECs as a local or regional solution. PRECs may play a helpful role in facilitating regional development, and use of the PREC can help corporations meet social-impact targets through their renewable energy commitments.

## Market Considerations and Dynamics

The PREC has significant potential as a new instrument that would assist in financing meaningful projects and offer a viable product in the global voluntary renewable energy market. The introduction of the PREC and its potential success will likely face a few market challenges on its path to global market adoption. A few of these challenges include:

**Pricing.** The price of RECs is largely determined by particular factors such as region of generation, date of generation, resource type, and resource-specific carve-outs, and prices can vary significantly. Ensuring that market participants understand and appropriately value the positive non-energy benefits of PRECs is important to help make the financial contribution of the customer's purchase meaningful to project economics. PRECs would likely trade at a premium to more established REC markets, but if the premium for PRECs is too high or too volatile, it may discourage buyers.

**Available product options.** In many markets, PPAs and VPPAs are preferred by corporations for their financial stability and direct role in supporting new project development. Other large buyers prefer

to make short-term REC purchases to help meet their renewable energy goals. Successful markets typically have a variety of product options available to consumers. To increase adoption of PRECs, it is important that they are available for use in these various product options to meet customer preferences.

**Standardization of benefits.** There may be significant variability in the pro-peace or environmental benefits of PRECs among different projects, based on the local circumstances under which the project has been developed. It is not clear whether customers would value PRECs from UN refugee camps, for example, differently than from more stable regions.

**Data integrity and verification.** Obtaining and ensuring accurate meter data from generation is a key component for ensuring PREC credibility, as is following the tracking system's reporting guidelines. Energy Peace Partners intends to be the official PREC issuer through the I-REC Registry and will incorporate best practices regarding metering, reporting, and verification.

**Renewable energy claims.** REC buyers in the North American market have sole title to the renewable energy use claims conferred by the RECs they purchase because the RECs are retired on behalf of the buyer. This is ensured in Green-e Energy certified renewable energy purchases because the program verifies public use claims. For example, if a company that sells its RECs into the voluntary market makes public statements about using renewable energy at an on-site solar facility from which the RECs were already sold, that facility is not allowed to participate in the Green-e certification program because another buyer could make a claim on those same RECs. If a humanitarian aid agency wants to make public statements about renewable energy generation or use at refugee camps that are selling PRECs, it will need to craft the specific language used to describe that use with care to prevent a double claim that could invalidate the PREC buyer's claim.

## Conclusion

Millions of people throughout the world continue to be forcibly displaced by violent conflict and natural disasters, and climate change is exacerbating these crises. The challenges for these most vulnerable communities are compounded as they often lack the political and economic mechanisms to finance their own solutions and are often in regions overlooked for climate financing. Renewable energy can improve the lives of those in fragile settings by creating long-term pathways to electrification, reducing fossil fuel dependence, increasing cost savings to international field missions, and encouraging peacebuilding.

PRECs contribute to addressing the challenge of the renewable energy investment gap in fragile states. The investment can deliver tangible benefits to vulnerable populations and the international field operations deployed to serve them.

Investments would be made in new renewable energy facilities located in fragile settings, while purchasers would possess verifiable claims to social co-benefits. By using existing market infrastructure to generate, track, and retire PRECs and ensuring the conferral of environmental and social attributes associated with the renewable energy generation, PRECs can be leveraged to create a new revenue stream to help overcome existing barriers to renewable energy project finance. In the current context of accelerating renewable energy growth and corporate commitment to sustainability and social responsibility, PRECs connect mature renewable energy markets with parts of the world where a greener development path can have a transformative degree of social impact.

# Endnotes


1. "Global Plan of Action: Mainstreaming Sustainable Energy Solutions in Displacement Settings". Clean Energy Solutions Center, 25 Sept. 2018, cleanenergysolutions.org/training/sustainable-energy-solutions-in-displacement-settings
2. unitar.org/ptp/sites/unitar.org.ptp/files/uploads/gpa_flyer_september_2018_3.pdf
3. Grafham, Owen, and Glada Lahn. "The Costs of Fuelling Humanitarian Aid." Moving Energy Initiative, MEI, Dec. 2018, www.chathamhouse.org/sites/default/files/publications/research/2018-12-10-Costs-Humanitarian-Aid2.pdf. This figure does not include energy costs for peacekeeping efforts, which we estimate is an additional $400 million a year.
4. Ibid.
5. "Global Climate Finance: An Updated View 2018." Climate Policy Initiative, Nov. 2018, www.climatefinancelandscape.org
6. Renewable Capacity Highlights. IRENA, Mar. 2018, irena.org/-/media/Files/IRENA/Agency/Publication/2018/Mar/RE_capacity_highlights_2018.pdf
7. Motyka, Marlene, et al. "Global Renewable Energy Trends." Deloitte United States, Deloitte Insights, Sept. 2018, www2.deloitte.com/insights/us/en/industry/power-and-utilities/global-renewable-energy-trends.html
8. Grafham, Owen, and Glada Lahn. "The Costs of Fuelling Humanitarian Aid." Moving Energy Initiative, MEI, Dec. 2018, www.chathamhouse.org/sites/default/files/publications/research/2018-12-10-Costs-Humanitarian-Aid2.pdf
9. "Corporate Sourcing of Renewable Energy: Market and Industry Trends." IRENA International Renewable Energy Agency, 2018, www.irena.org/publications/2018/May/Corporate-Sourcing-of-Renewable-Energy.
10. "RE100." RE100, there100.org
11. "BRC Deal Tracker." Business Renewables Center, Rocky Mountain Institute, 2018, businessrenewables.org/corporate-transactions/
12. "Corporate Sourcing of Renewable Energy: Market and Industry Trends." IRENA International Renewable Energy Agency, 2018, www.irena.org/publications/2018/May/Corporate-Sourcing-of-Renewable-Energy
13. Energy Peace Partners intends to be the issuer of in PRECs in fragile regions throughout the world using the I-REC Registry.
14. "ANNEX: RE100 PROGRESS AND INSIGHTS ANNUAL REPORT." The Climate Group, RE100, Nov. 2018, www.theclimategroup.org/sites/default/files/downloads/annex_2_-_re100_progress_and_insights_annual_report_november_2018.pdf
15. Ibid.
16. Factors Affecting Gasoline Prices—Energy Explained, Your Guide To Understanding Energy. Energy Information Administration, May 2017, www.eia.gov/tools/faqs/faq.php?id=307&t=11
17. This same opportunity to leverage humanitarian operations today to build energy infrastructure for the post-conflict era, exists in other displaced persons camps across South Sudan, and in other conflict settings. For more see www.usip.org/sites/default/files/2018-01/sr418-south-sudans-renewable-energy-potential-a-building-block-for-peace.pdf
18. Yee, Amy. "The Power Plants That May Save a Park, and Aid a Country." The New York Times, 30 Aug. 2017, www.nytimes.com/2017/08/30/business/congo-power-plants-poaching.html
19. ecopeaceme.org/uploads/14379199451~%5E$%5E~Water_Energy_Nexus_Web4.pdf
20. Ibid.
21. "Fragile States Index 2018." Fragile States Index, Fund for Peace, 2018, fundforpeace.org/fsi/data/
22. Mozersky, David, and Daniel Kammen. "South Sudan's Renewable Energy Potential A Building Block for Peace." United States Institute of Peace, Jan. 2018, www.usip.org/sites/default/files/2018-01/sr418-south-sudans-renewable-energy-potential-a-building-block-for-peace.pdf
23. LCOE is the net present value of the unit-cost of electricity over the lifetime of a generating asset.
24. Mozersky, David, and Daniel Kammen. "South Sudan's Renewable Energy Potential: A Building Block for Peace." United States Institute of Peace, Jan. 2018, www.usip.org/sites/default/files/2018-01/sr418-south-sudans-renewable-energy-potential-a-building-block-for-peace.pdf
25. Null power is the underlying power remaining when the RECs have been stripped off and sold elsewhere. Null power is not renewable but is the unspecified and undifferentiated power that has the attributes of the overall system mix or the residual mix where specified power purchases have been removed.
26. "Greening the Blue Report 2017." United Nations Environment Programme, 2017, www.greeningtheblue.org/sites/default/files/Greening%20the%20Blue%20report%202017%20-%20Brochure%20%28web%20-%20low%20res%29.pdf
27. "39 UN Agencies and Entities Achieved Climate Neutrality in 2016." UNFCCC, Nov. 2017, unfccc.int/index.php/news/39-un-agencies-and-entities-achieved-climate-neutrality-in-2016

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