

CASE STUDY

CROSSBOUNDARY ENERGY

OCTOBER 2016

EXECUTIVE SUMMARY

CrossBoundary Energy is dedicated to financing on-site solar generation for commercial and industrial businesses in sub-Saharan Africa – a critical development need that is systemically under-financed. CrossBoundary Energy finances the construction, operations, and maintenance of solar projects, and is repaid through the sale of electricity to businesses or through lease arrangements. Their fund, Cross Boundary Energy I (CBE), has an innovative two-tier equity capital structure. The United States Agency for International Development (USAID), through CrossBoundary, contributed a small junior tier of funding to CBE (subject to first losses) to catalyze private investment into the larger senior tier. CBE invests its equity through special purpose vehicles (SPVs) that can also raise debt to increase total capital available for projects. CBE targets both financial returns and positive environmental impact for investors, while aiming to establish commercial and industrial solar as an investable asset class in sub-Saharan Africa. CrossBoundary Energy has a prospective pipeline of USD 100M+ in opportunities.

CrossBoundary Energy's design and fundraising experience presents useful insights for others looking to create or invest in similar vehicles, including:

- Risk mitigation provided by subordinated capital is particularly important when investing in unproven sectors important for development
- Building a track record with aid agencies and identifying alignment with aid agency objectives helps secure funding
- Deal sponsors should be aware of the often complicated requirements associated with aid agency funding, as well as the time required to finalize blended finance structures
- Deal sponsors should be wary of introducing additional, unnecessary complexity into structures
- Aid agencies can provide valuable support beyond subordinated capital, such as signalling credibility and facilitating connections to relevant partners

SYNOPSIS

Manager	CrossBoundary Energy
Mandate	Finances construction, operations, and maintenance of solar projects for commercial and industrial businesses in sub-Saharan Africa
Legal structure	Limited partnership fund (CBE) for equity investors; the fund owns multiple SPVs, which can raise additional debt capital and deploy both sources of capital into projects
Fund vintage	2015
Size	CBE: USD 8.8M equity SPVs: Prospectively USD ~20M debt
Capital structure	CBE: USD 7.5M senior limited partner tier, USD 1.3M junior tier SPVs: Equity from CBE, senior debt
Investment instruments	CBE owns solar generation projects or finances through leases and loans
Investment size	Investments may vary between USD 200K and 10M; on average between USD 1M and 2M
Fund term	20 years
Fund target return	Infrastructure-level returns (below typical private equity target returns)
Fundraising status	Equity capital fundraising closed; debt capital fundraising ongoing
Example impact metrics	Increased access to finance, expanded access to affordable electricity, enabled growth of African enterprises, decreased carbon emissions, increased solar adoption

INTRODUCTION

Electricity in sub-Saharan Africa is expensive and unreliable. Businesses experience an average of eight power outages per month¹ and approximately half rely on expensive and environmentally harmful diesel to supplement their grid supply.

Solar energy is cleaner and often cheaper over the long term than the grid supply of electricity in most African countries.² However, many businesses hesitate to adopt solar because of high upfront equipment and installation costs, a lack of affordable financing options, the need for ongoing maintenance and management, and the perceived technical risk of solar.

CrossBoundary was established in 2011 to provide investment advisory services across all sectors in fragile and frontier markets, and has offices in Washington DC, New York, Nairobi, Bamako, and Johannesburg (opening late 2016). In 2015, CrossBoundary completed the set-up of CrossBoundary Energy as a separate vehicle to invest in solar projects for commercial and industrial businesses and help address Africa's electricity challenge.

DESIGN AND FUNDRAISING

CrossBoundary Energy came about through CrossBoundary's advisory projects in sub-Saharan Africa that were energy-related. By working on these projects, the team was able to see the clear economic proposition of solar energy for businesses in the region, where the grid supply is unreliable and alternative power sources such as diesel are expensive and environmentally harmful.

CrossBoundary began structuring CrossBoundary Energy and initial equity capital fundraising for the fund, CrossBoundary Energy I (CBE), in late 2013. While CrossBoundary Energy was in the early stages of development, the US Government launched Power Africa, an initiative to bring together experts, the private sector, and governments to increase access to power in Africa. As clean energy in Africa became an important development priority for the US Government, CrossBoundary Energy was a natural fit with Power Africa and the United States Agency for International Development (USAID).

The CBE transaction was structured by USAID's Office of Private Capital and Microenterprise (PCM); and funded by Power Africa. PCM was originally housed within Power

Africa, but after the success of the Power Africa model in encouraging private sector participation, was spun out as a stand-alone office dedicated to encouraging private capital participation across USAID's sectors and geographies.

Power Africa, through USAID's Global Development Alliance (GDA)³ model, provided CrossBoundary with a USD 1.3M repayable grant contribution, which was then contributed by CrossBoundary to the CBE fund, functioning as subordinated equity funding subject to first losses. This USAID contribution was contingent on CBE raising additional equity capital from private investors and USAID diligence and approval of all equity investors. CBE had an initial fundraising target of USD 6.5M, with USAID requiring a leverage ratio that exceeded five to one – a standard requirement for USAID GDA funding used to catalyze equity investment. USAID's contribution provided a unique de-risking mechanism to attract private investors to CBE, partially protecting their downside and accelerating the return of their initial investment. In addition to funding, USAID and Power Africa helped connect CrossBoundary to relevant partners and signal credibility externally, which was important given the relatively young CrossBoundary fund management team.

CBE was a compelling proposition for Power Africa and USAID because of its goal of catalyzing commercial and industrial solar energy in Africa, which naturally drives important development outcomes. In addition, CBE's structure as an intermediary and aggregator of smaller projects allowed USAID to indirectly reach a large number of renewable energy installations with less administrative burden. A main barrier to completing the transaction, however, was the novelty of the structure. Typically, USAID grants are given to non-profit organizations and the money is never returned. In this case, providing a grant that functioned as subordinated capital in a private equity fund and that could eventually be returned to the US Treasury was a first for USAID and created many unique bureaucratic hurdles. The CrossBoundary team and their partners at USAID became experts in obscure provisions of federal regulations and USAID processes in order to ensure a fully compliant and sustainable structure.

In parallel to securing USAID funding, CrossBoundary continued fundraising for equity capital from private investors – primarily impact-oriented family offices such as the Blue Haven Initiative, Treehouse Investments, and Ceniath. The majority of private investors that invested in CBE are mission-driven, but finance-first – they seek market-rate returns. USAID's junior contribution through

¹ According to the World Bank

² The cost of solar has dropped by over 80% since 2008 according to the World Bank

³ GDA is USAID's mechanism for supporting public-private partnerships.

CrossBoundary was an important factor influencing private investors’ decisions to invest, and many may have not invested without this protection. Finalizing the junior tier expedited the parallel fundraising process – CBE reached a first close approximately one month after the USAID contribution was fully committed. The expected term of CBE – 20 years – did not have a material impact on private fundraising as distributions are made at least annually, no final liquidity event is required, and private investors consider themselves patient capital providers.

CBE was established as a limited partnership fund to raise equity capital. Multiple special purpose vehicles (SPVs) owned and equity funded by CBE can raise debt to increase total capital available for projects.

The design and fundraising process began in late 2013, and equity capital fundraising reached a close at the end of 2015 – approximately a two-year time period. Negotiations for a first tranche of debt are expected to be completed soon. CrossBoundary’s advisory income allowed the team to establish CrossBoundary Energy with limited external support, while structuring the vehicle as a smaller scale proof of concept that is well suited to the current market size. Grant funding from the Shell Foundation and the African Clean Enterprise Facility supported establishment costs and legal fees. Chadbourne & Parke provided legal advice with local counsel support from Anjarwalla and Khanna and BLC Chambers. AXIS and Viva Africa provided local structuring and fund administration services.

STRUCTURE AND GOVERNANCE

LEGAL STRUCTURE

CrossBoundary Energy employs an innovative structure with two types of vehicles. CBE is a limited partnership fund and was used to raise equity capital. CrossBoundary considered a variety of alternative structures (including a holding company) to raise equity, but opted to adopt a standard fund structure that would be familiar to private equity investors. Multiple SPVs have been established due to the long-term, contracted nature of cash flows from on-site solar projects, tax considerations, and in order to raise debt capital on either a country by country or portfolio basis.

Both CBE and the primary SPVs are domiciled in Mauritius. Country-level SPVs have also been established where needed. CrossBoundary considered various domiciles in addition to Mauritius, including Delaware and Amsterdam, but eventually chose Mauritius because of favourable double taxation agreements with relevant African nations. Further, Mauritius has become the domicile of choice for the majority of funds investing in Africa.

CAPITAL STRUCTURE

CBE reached a final close at USD 8.8M. The capital structure of CBE is as follows:

- **Class A Equity, USD 7.5M:** The senior tier in the fund, owned by private investors and CrossBoundary management.
- **Class B Equity, USD 1.3M:** The junior tier in the fund (subject to first losses), contributed by USAID funding through CrossBoundary as a Partner of the fund. Class B Equity cannot comprise more than one-fifth of the fund and must only directly finance projects (i.e., does not contribute to management fees or carry).

SPVs can raise debt capital, leveraging equity injections from CBE, to increase the total amount of capital available for projects. Debt capital could eventually total over USD 20M, with development finance institutions a likely source.

The fund has a 3-year investment period, with all investments expected to be fully liquidated by year 20. Equity capital will be returned to investors in a waterfall structure, as follows:

- Class A Equity is returned to investors
- Class B Equity is only returned to the US Treasury when all capital has been returned to Class A investors
- Surplus distributions beyond original equity capital contributed are split pro-rata
- Surplus distributions and excess cash flow at the SPV level flow back to the fund; the SPVs are not used to recycle capital

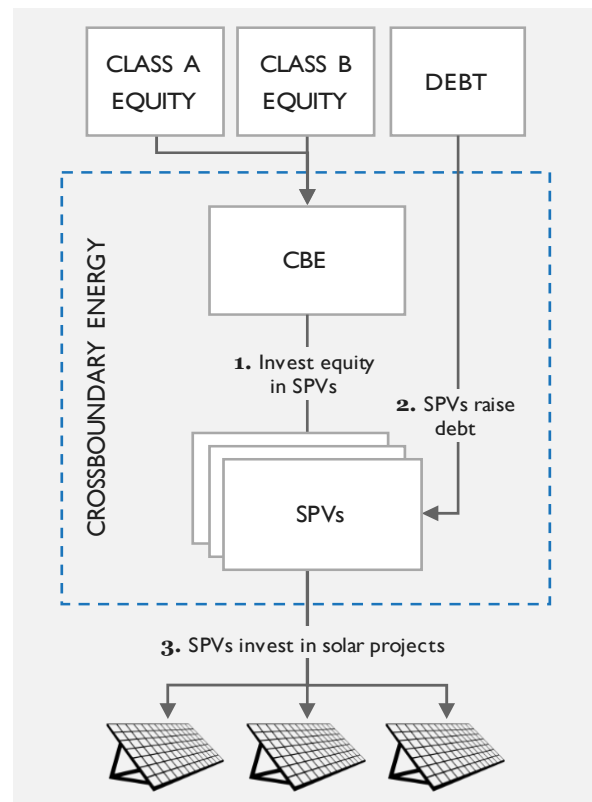


Figure 1: Structure of CrossBoundary Energy

GOVERNANCE

A limited partner advisory committee (LPAC) provides oversight over CBE at the fund level. The LPAC must approve larger investments and certain other material decisions. The investment committee consists of three CrossBoundary partners.

OPERATIONS

INVESTMENT CRITERIA

CrossBoundary Energy targets well-established businesses in sub-Saharan Africa, initially in East Africa, with consistent and significant power needs. These businesses could include:

- Manufacturing and light industrial businesses (e.g., processing, packaging)
- Commercial real estate and hospitality businesses (e.g., shopping malls, hotels, hospitals, off-grid safari lodges)
- Agribusinesses (e.g., horticulture, tea, coffee)

CrossBoundary Energy can finance the following solar projects:

- Solar/grid-tied systems (direct supply of generated power to supplement the grid)
- Solar/diesel-hybrid systems (integrated with prime or backup diesel generation)
- Solar/battery systems (for off-grid businesses reliant on diesel)

CrossBoundary Energy does not have a target number of projects, but expects to finance between 10 and 15 projects over the first 12 to 18 months. Typical financing is expected to be between USD 1M and USD 2M, but this figure could vary substantially, ranging from as low as USD 200K for smaller projects to up to USD 10M or more for larger systems that industrial and mining projects would require.

INVESTMENT PROCESS

CrossBoundary Energy's partnership with SolarAfrica (formerly known as NVI Energy) is a critical element of all financing activity. CrossBoundary Energy and SolarAfrica partnered on the SolarAfrica platform to provide project developers with a fully financed solution to offer customers for solar projects. SolarAfrica provides technical oversight and asset management of solar projects, and also acts as a platform for approved local solar developers and contractors to collaborate on solar projects.

The following figure illustrates the typical life cycle of a CrossBoundary Energy-financed solar project and the role of SolarAfrica. More detail is provided after the figure.

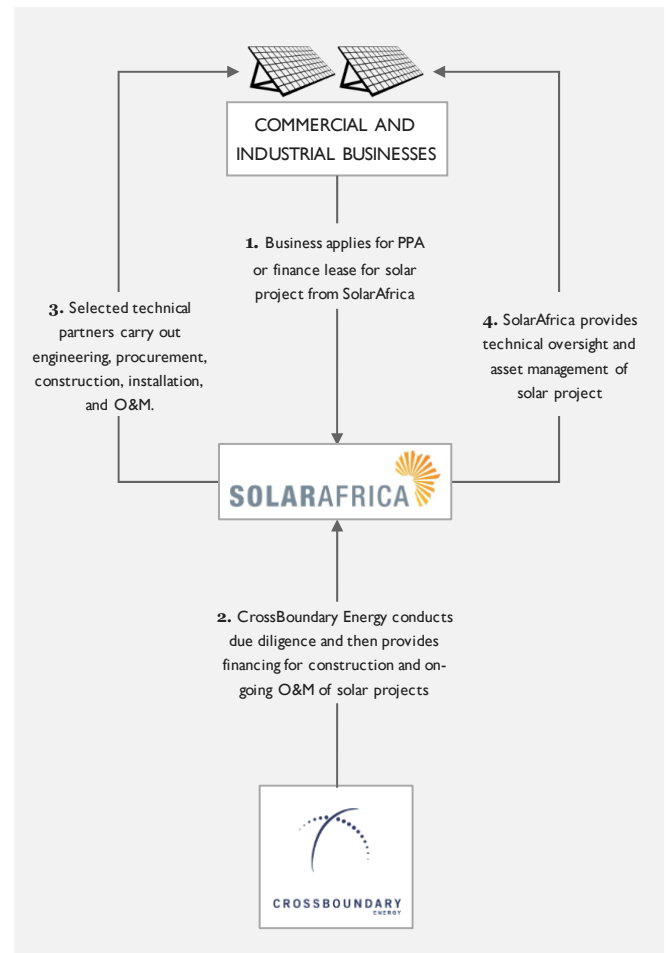


Figure 2: Typical lifecycle of a CrossBoundary Energy-financed solar project

Step 1: Commercial and industrial businesses learn of the opportunity to secure financed solar solutions through SolarAfrica's local development partners, the SolarAfrica.com website and through targeted SolarAfrica sales and marketing outreach in each geography. SolarAfrica finances the solar system either through a Power Purchase Agreement (PPA) or a finance lease. Both the PPA and finance lease include financing for the construction and installation of the solar project, insurance, and ongoing monitoring through the life of the contract. The main difference between the two is asset ownership: in the PPA, CrossBoundary Energy owns the assets and clients pay based on how much electricity is produced, while in the finance lease, clients acquire ownership of the asset and payments are typically fixed. Clients bear foreign exchange rate risks as all contracts are linked to USD. However, CrossBoundary Energy is able to bear currency conversion risks by invoicing in local currency. SolarAfrica acts as a single client point of contact for all contracts.

Step 2: CrossBoundary Energy conducts due diligence on the proposed project, and after approval, provides financing for the construction and ongoing operations and maintenance (O&M) of the solar project.

Step 3: Selected technical partners (such as SMA Sunbelt, SolarCentury, PowerGen, and OneShore) on the SolarAfrica platform carry out engineering, procurement, construction, installation, and O&M for the solar project.

Step 4: SolarAfrica provides technical oversight and asset management throughout the term of the contract.

INVESTMENT ACTIVITY TO-DATE

CrossBoundary Energy has a prospective pipeline of USD 100M+ of projects and several installations already under ownership. In early 2016, the 858 kWp⁴ solar installation at the newly opened Garden City Mall in Nairobi was commissioned. The project is the largest rooftop solar system in East Africa and the largest solar carport system in Africa. It is also one of the largest solar PPAs with a private consumer in sub-Saharan Africa. A second project, construction of a 75 kWp solar/battery installation for a luxury ecotourism resort and ranch in Kenya has been completed, and two additional sites are in progress in Rwanda. Additional projects have been signed that are not yet public.

GARDEN CITY SOLAR CARPORT

Project description: Garden City is a 33,000 square meter mall. The 858 kWp solar installation is mounted above the rooftop carpark, providing clean energy to the mall and to the surrounding mixed-use buildings.

Project size: 858 kWp solar system

Contract term: 12 years

CO2 avoided: >650 tons per year

Annual electricity generation: 1256 megawatt hours

Status: Fully operational as of April 2016

Figure 3: Garden City Solar Carport

LOISABA SAFARI CAMP

Project description: Loisaba is an ecotourism resort and ranch in Kenya, located approximately 250km north of Nairobi. The Loisaba Community Trust is protected by The Nature Conservancy (a US organization).

Project size: 75 kWp solar / battery system (209 kWh battery storage)

Contract term: 10 years

CO2 avoided: ~100 tons per year

Annual electricity generation: 115 megawatt hours

Status: Fully operational as of July 2016

Figure 4: Loisaba Safari Camp

IMPACT METRICS

CrossBoundary Energy considers impact with three lenses: enterprise, environment, and ecosystem. At the enterprise level, CrossBoundary Energy aims to increase access to finance, expand access to affordable electricity, and enable growth. At the environment level, CrossBoundary Energy aims to decrease carbon emissions. At the ecosystem level, CrossBoundary Energy aims to stimulate increased solar adoption, driving growth and employment for solar partners and validating this new asset class. For each, CrossBoundary Energy tracks associated impact metrics; for example, the following is measured in the environment category of decreased carbon emissions:

- Offset greenhouse gas emissions
- Duration of power contract
- Actual solar generation
- Projected solar generation
- Lifetime projected greenhouse gas emissions reduction

FOLLOW-ON VEHICLES

CrossBoundary believes distributed solar generation for African businesses will fundamentally reshape the energy landscape. CrossBoundary Energy is a proof of concept that will demonstrate commercial and industrial solar as a low risk, predictable yield investment opportunity, and CrossBoundary Energy plans to raise much larger follow-on vehicles that may use a similar structure.

KEY INSIGHTS

CrossBoundary Energy's design and fundraising experience presents several insights useful to others looking to create or invest in similar blended vehicles:

- Risk mitigation provided by subordinated capital is particularly important when investing in unproven sectors important for development. CBE is the first fund of its kind for commercial and industrial solar in sub-Saharan Africa, an investment sector still in its infancy. Investors therefore required risk protection as they considered the investment high-risk.
- Investing time to build a track record with aid agencies and identifying alignment with internal aid agency objectives helps secure funding. CrossBoundary Energy's inception came just before the launch of Power Africa. CrossBoundary Energy's alignment with emerging US Government goals, combined with

⁴ Kilowatt peak: output power achieved by a solar module under full solar radiation

CrossBoundary's track record, helped CrossBoundary to successfully navigate the bureaucracy of USAID.

- Deal sponsors should be aware of the often complicated requirements associated with aid agency funding. For example, certain requirements – such as unusual restrictions on how the contribution can be spent or the requirement for the aid agency's due diligence and approval of all LPs – must be carefully considered as a cost of securing subordinate capital.
- Deal sponsors should also be aware of the time required to finalize blended finance structures, particularly innovative ones, and should build this into their work planning and expectation setting with stakeholders. The process with USAID took almost two years from concept stage to final fund close. With many lessons learned, CrossBoundary believes a similar structure could be replicated more quickly today.
- Where possible, deal sponsors should avoid introducing additional, unnecessary complexity into their structure. CBE is the first fund of its kind for commercial and industrial solar in sub-Saharan Africa, CrossBoundary Energy is a first-time fund manager, and USAID had never provided funding to function as first-loss capital before. Because of these many "firsts", CBE adopted a common fund structure (i.e., a limited partnership fund) that private equity investors were familiar with, in an attempt to reduce the complexity of an already complex structure.
- Aid agencies can provide valuable support beyond subordinate capital, such as signalling credibility and facilitating connections. For example, USAID's PCM Office and Power Africa more generally have connected CrossBoundary Energy with relevant partners both during and after fundraising.

SOURCES

Interviews with CrossBoundary management, USAID, Power Africa, and private investors.

CrossBoundary documentation.

Africa Capital Digest. (2015). CrossBoundary Raises First Energy Fund. Available [here](#).

CrossBoundary Energy. (2015). CrossBoundary Energy formally announces raise of \$8M in equity to bring solar power to African businesses. Available [here](#).

PV Magazine. (2015). CrossBoundary closes on \$8 million for C&I solar in Africa. Available [here](#).

Quartz. (2016). Why we're building an investment fund to back solar energy in Africa. Available [here](#).

ABOUT CONVERGENCE

Convergence helps public and private investors find and connect with each other to co-invest in blended finance deals in emerging and frontier markets

INVESTMENT NETWORK: An online platform where investors can connect with deals in emerging and frontier markets

MARKET BUILDING TOOLS: Knowledge resources to help investors improve their blended finance understanding and capabilities

DESIGN FUNDING: Grant funding for practitioners to design innovative financial instruments that would otherwise be too risky or complex to pursue

www.convergence.finance