



Challenges and Opportunities: Using Carbon Finance to Scale SMEs in West Africa

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Abstract

The International Financial Corporation (IFC) estimates that small and medium Enterprises (SMEs) provide from 50% to 60% of employment worldwide. In addition, many of these enterprises provide basic goods and services, including energy, water, and education to local communities. These SMEs or social enterprises, as they are sometimes referred to in development circles, present a significant opportunity to reach masses of rural and urban poor living at the base of the economic pyramid. They are also channels through which socially responsible investors deploy cleaner, sustainable, distributed technologies at scale by using innovative mechanisms such as carbon finance.

This article describes the lessons learned from three months of field research, desk research, and interviews in Mali and Ghana, and the expert input of Erik Wurster of Up Energy (and formerly of E+Carbon), and Toyola Enterprises Limited (TEL). Traditionally, the overall cost of carbon project development has made only large-scale implementations of carbon projects viable. As a result, carbon finance has mainly been used to finance large-scale renewable energy projects or industrial infrastructure upgrades. Very rarely do these projects directly benefit the people who need access to clean energy the most.

E+Carbon is, however, piloting a new carbon methodology to scale efficient cookstove enterprises in West Africa by bundling and aggregating carbon projects across geographies. This programmatic approach to carbon projects is yet to be proven but is showing early signs of success. However, project development in emerging markets is not without institutional, financial, and cultural challenges. Managing a carbon project requires technical assistance, up-front capital costs, and a strong risk appetite. New methods of risk sharing with rural banks and microfinance institutions (MFIs) are being used to defray some of the liquidity constraints faced by SMEs and could be extended to carbon financing. Finally, mobile technology platforms are showing potential for scale and could significantly reduce costs, increase transparency, and ease the labor involved in verification of credits.

Challenges and Opportunities: Using Carbon Finance to Scale SMEs in West Africa

Small and medium enterprises (SMEs) in emerging markets are the engines of growth in their economies. Not only do they create jobs and social security, but they also fill the gaps in government infrastructure by providing basic goods and services to low-income communities. SMEs are beginning to tackle the energy infrastructure challenges in their countries by providing customized energy solutions to their communities. In many instances they are profit-making enterprises that provide services like energy, clean water, and mobile phone technology to rural communities. They are becoming important distribution channels through which small-scale, low-cost clean technologies are made available to people living at the base of the pyramid (BoP) (Prahalad 2004). But SMEs are often hindered by the lack of low-cost capital to grow their business operations. In order to fill this gap, a new breed of financial intermediaries is using *impact investments* (O'Donohoe et al 2010) to catalyze growth of SMEs while also achieving positive social and environmental results. In addition, a few of these intermediaries are pioneering the use of carbon finance along with their equity and debt investments to seed small-scale, disaggregated carbon projects that can generate environmental returns and benefit the local communities.

Objective

The objective of this analysis is to discuss the unique challenges of developing carbon projects in emerging markets for the benefit of local communities while generating social, environmental, and financial returns to the investor. The research draws on the author's work with E+Carbon's investments in West Africa. Specifically, the author discusses the institutional, technical, and financial challenges and describes the potential risk mitigating actions and opportunities for cost savings and partnerships.

Methods

The background research and inquiry was accomplished via fieldwork, desk research, and expert opinion interviews in July and August 2009. Specifically it included:

- Desk research (including primary and secondary data collection)
- Field research in Mali and Ghana
 - Expert interviews
 - Field observations (Kumasi, Eastern Accra, Bamako)

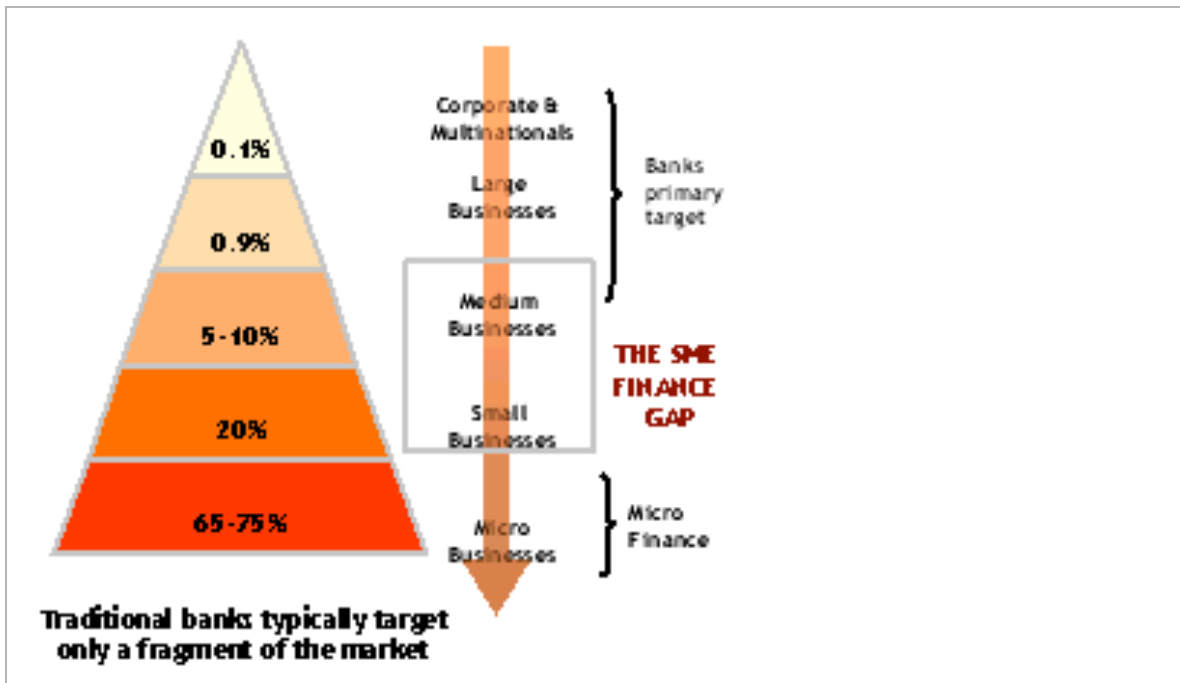
Financing Small and Medium Enterprises

As engines of growth in developing economies, SMEs are often critical for the economic and social development of emerging markets and play a major role in creating jobs and generating revenue for low-income people. Not only do they foster economic growth and social stability, but in many instances they also provide low-income communities with access to basic goods and services. More recently, they have become important channels for the large-scale distribution of many newer technologies such as solar power, water purification devices, and mobile phones. In recognition of their many catalytic impacts, SMEs have become the focus of various government and international aid initiatives. The IFC has provided a total of \$8.5 billion worldwide as of June 2010 to finance micro, small, and medium enterprises (MSMEs). In fiscal year 2010 alone, the IFC made available \$2.5 billion (IFC 2010).

The World Bank estimates that formal SMEs contribute an average 51.5% of GDP in high-income countries—but only 15.6% in low-income countries. By contrast, the informal micro-enterprise sector accounts for an average 47.2% of GDP in low-income countries, but just 13% in high-income countries. In large part this disparity has been attributed to the lack of access to financial services for SMEs. Private equity funding plays an important role in the development of private sector companies. While this funding has increased steadily in the past five years in developed countries (representing 2.3% of GDP in the U.K. and 1.7% in the U.S.), it remains at much lower levels in emerging markets (IFC 2008).

Private investors are held back by the high transaction costs, illiquid capital markets, regulatory risks, and poor legal infrastructure that is characteristic of most emerging markets today. As a result, SMEs are stuck in the “missing middle” (Figure 1). They are too big to be eligible for microfinance and are still too small to attract commercial capital at reasonable rates.

Figure 1: The Financing Gap



Source: "SME Banking," Global Financial Markets, *The World Bank Group: IFC, 2010*.

Investors are beginning to recognize the magnitude of this gap and the opportunity for investment in high growth SMEs. The IFC has paved the way for a new breed of investor to enter the growing SME financial services market. These intermediaries, often called *social venture funds*, provide growth capital and technical services to SMEs in an attempt to bridge the financing gap, and range from commercial entities like the IFC to nonprofits and socially minded angel-investors. Entities such as E+CO, Root Capital, and the Acumen Fund are pioneers in this emerging field, which is now widely referred to as impact investing (O'Donohoe et al 2010).

SMEs—Tackling the Energy Challenge in Emerging Markets

Huge capital investments will be required in the coming decades to meet the energy needs of developing countries. Climate change, dwindling fossil energy resources, and the pressure on the health of communities is driving momentum towards cleaner, renewable forms of energy. Financing this infrastructure development will be a crucial challenge in the coming decades. The United Nations Environment Program (UNEP) acknowledges two contrasting approaches—the investment in large-scale utilities approach, and the energy enterprise approach. (Kappen 2008). The former requires investment in large centralized utilities that build infrastructure, which in turn will foster enterprise. The latter fosters the creation of multiple distributed energy enterprises via investments in entrepreneurs who create localized energy infrastructure. The key advantage of the energy

enterprise approach is its flexibility in being able to provide customized solutions for local markets. It is for this reason that Kappen claims that the financing of energy SMEs is “the sensible thing to do while waiting for capacity additions and rural electrification.” The European Investment Bank (EIB) is backing this approach and, to signify its intent, signed four loans in June 2009 in Serbia that benefit energy projects of SMEs, for an aggregate amount of EUR 139.50 million.

The EIB investments are part of a growing tide of investors seeking well-managed energy enterprises that are delivering clean energy in emerging markets. The investment thesis has gained much traction among impact investors who are seeking combined environmental, social, and financial returns.

SMEs and Carbon Finance

While impact investors continue to refine their investment strategies, a few innovative investors are experimenting with new business models that take advantage of financial mechanisms such as carbon finance, which is monetized via sale of credits into compliance and voluntary carbon markets. This intersection of carbon finance with private investment offers financial intermediaries a new method for leveraging their capital and improving their social, financial, and environmental returns.

However, carbon finance is a complicated tool, often poorly understood and implemented. It is inherently risky—with many regulatory risks and compliance and governance challenges—and requires strong technical capacity and financial support to implement successfully. Such risks and complications combined with the uncertainty of international policy addressing climate change and the lack of a viable carbon market beyond 2012 currently make carbon finance an unattractive investment to most investors. Furthermore, from an impact investor’s point of view, even when the economics make sense they tend to favor large-scale industrial type projects that involve smoke-scrubber installations or renewable energy generation in which marginal costs are low and scale is easily achieved. While these projects reap significant environmental benefits, they very rarely directly benefit the local people or their communities.

E+Carbon is a social enterprise founded in 2007 by E+Co to leverage carbon finance for the purpose of reducing poverty and mitigating environmental degradation. E+Carbon commercializes carbon assets arising from the cost-effective, life-altering end user technologies that abate large quantities of greenhouse gas emissions. E+Carbon’s primary focus is on efficient biomass cookstove projects, which offer the added benefit of significantly improving public health and mitigating deforestation. E+Co has realized the potential for carbon finance to grow smaller scale, distributed energy projects. Unlike more traditional carbon finance developers however, E+Co strives to ensure that dollars

flowing from carbon credits make it to the bottom of the pyramid. To that end, the organization announced in 2009 that it successfully registered two energy efficient cookstove projects with the [Gold Standard](#), a Swiss-based nonprofit organization that serves as a governing body for Verified Emissions Reductions (VERs). These are among the first such projects ever registered with the Gold Standard.

E+Carbon is signaling a trend that is forcing many development and venture philanthropy organizations to take a closer look at carbon finance and how it fits into their portfolios. Despite its complexities, carbon finance offers the patient investor and the philanthropist a unique opportunity to achieve both financial and environmental returns at scale. When done right, it provides a steady cash flow over a 20-year period and can result in the SME becoming less reliant on expensive debt or equity capital. It can also increase an investor's appetite to extend debt to an SME by acting as collateral for nascent SMEs with few tangible assets. Carbon finance has the twin benefits of providing cleaner energy to the poor while providing a return on investment at market rates to investors. However, the projects are not without significant risks and institutional challenges.

Deploying Carbon Finance to Scale Efficient Cookstoves

Wood and charcoal meet 75% of Ghana's fuel requirements. The practice of cooking with biomass is one of the main reasons behind the demand for wood fuel, and it contributes to an annual harvest volume of 29.4 million m³ of wood in the country.

The Opportunity: A Compelling Social Investment

TEL, an E+CO investee, has been manufacturing and distributing efficient charcoal cookstoves as a means of tackling this problem. The Toyola Coalpot has a ceramic liner and burns charcoal more efficiently than traditional cookstoves, saving the user valuable expenditure on charcoal while reducing the amount of smoke emitted during cooking. The company has manufactured and distributed more than 130,000 stoves in Ghana since December 2007. These energy efficient cookstoves are important for a number of reasons. They are 40% more efficient than traditional stoves, thus significantly reducing the amount of charcoal that is used for cooking. The World Health Organization (WHO) estimates that indoor air pollution is responsible for 1.5 million deaths a year due to pneumonia, chronic respiratory disease, and lung cancer. This death toll falls disproportionately on women and children, who spend a lot of their time near fires. Indeed, more than half of the victims are children under the age of five. A third are women. To achieve the UN millennium development goals by 2015, 485,000 people will need to gain access to cleaner fuels every day for the next 10 years.

Carbon Finance as an Enabler of Scale

Until recently, the biggest barriers to scale in Ghana's efficient cookstove sector were affordability (the ability of the customer to pay the retail price of the stoves) and availability of capital for the expansion of manufacturing and distribution capacity. Carbon finance has changed the existing paradigm. Efficient stove manufacturers, such as TEL can now potentially monetize the carbon that their stoves offset, thereby generating much-needed additional streams of cash. This revenue can enable the reduction of stove prices for the end consumer and also inject liquidity and investment into the business, thereby addressing the cookstove sector's biggest constraint to scale: capital.

TEL's cookstoves generate carbon offsets as they reduce the greenhouse gas emissions of the user—a result of the more efficient combustion process. As primary recipients of carbon revenues, stove manufacturers like TEL will now be able to finance large-scale production of efficient stoves. Carbon finance may also be used to subsidize the price of the stove, thus making it cheaper than its inefficient counterpart, another factor that will increase adoption. It could increase the income capacity of the large informal sector that makes up the stove industry—metal workers, ceramic artisans, sales agents and retailers—and yield health benefits for women and children, as indoor air pollution is reduced.

Cookstove Carbon Finance Economics

The price of stoves is 8 Ghana cedis (about USD 5) in the southern region of Ghana and approximately 13 cedis (about USD 8) in the North (2008 prices). The higher prices in the north reflect the higher cost of manufacturing and poor distribution infrastructure in the northern region of Ghana. This price is relatively high in comparison to that for traditional stoves (from 3 to 5 cedis) and it makes the Toyola coalpot unaffordable for the urban poor. However, gross carbon revenues over the three- to five-year life of the stove could range from USD 18 to USD 25 and could therefore subsidize the entire price of the stove, making it affordable and within the reach of an average rural customer in Ghana. Volumes make all the difference, however, as the cost of developing and bringing carbon credits to the market can range from USD 150,000 to USD 300,000. TEL and E+Carbon would have to sell 50,000 stoves just to break even. Projecting growth in the cookstove market from 1.83 to 2.35 million in Ghana over a 10-year period, TEL and E+Carbon are confident that the carbon finance economics make financial sense.

The opportunity to scale clean technologies in emerging markets using a similar carbon finance model extends beyond cookstoves. There is an opportunity to achieve similar success using solar lantern, biogas, water filtration units, or other technology that requires a price subsidy and/or significant capital investments to attain scale or adoption among low-income communities. Carbon finance, when deployed alongside growth capital and

technical assistance can become a significant point of leverage for an SME. It enables access to a steady stream of cash flows for a length of time and can be used as collateral to secure commercial finance that was previously unattainable.

Challenges of Developing Carbon Projects in West Africa

The following section outlines some of the challenges and risks that carbon developers and investors face when making investments in small-scale, distributed carbon projects. Although this understanding has been gained from E+Carbon's experience in West Africa, many of the challenges outlined are common to projects in any developing country context.

Complex Modalities and Procedures Lead to High Transaction Costs

Carbon projects are only eligible for revenues when the developer can prove that the project is truly additional, i.e., the reduction in greenhouse gas emissions by proposed project activities is additional to any reduction that would occur in absence of the project. The Marrakesh Accords state that a project activity is additional if anthropogenic emissions of greenhouse gases are reduced below those that would have occurred in the absence of the carbon project. The "additionality" proof is usually established within a Project Design Document (PDD), and it requires a high level of technical aptitude and knowledge of the different certification standards. This know-how is often not available in countries like Ghana and Mali in West Africa. As a result the process of writing a PDD is an expensive endeavor that usually requires the hiring of specialists to measure baseline emissions and the acquisition of technical expertise to measure and communicate about the reduction of emissions from the project activities. In the case of E+Carbon, the services of Impact Carbon and Berkeley Air were contracted to complete the first draft PDD and measure the specific amount of fuel consumed by a TEL and Katene cookstove. However all other aspects of the project development were managed directly by E+Carbon.

Once a project is registered and a PDD is written, external auditors need to be hired to certify the credits generated in accordance with certification bodies like the Gold Standard. Their requirements are rigorous and stringent, and adherence to them requires a high level of competence and technical capacity. While these external validations are not mandatory in voluntary markets, the certification increases the value of the credits and is often desirable from the point of view of a buyer.

Upfront Capital Costs and the Need for Bridge Financing

Carbon projects are risky ventures. A high upfront capital investment is required from either the SME or the project developer to perform the initial baseline studies, write the PDD, and perform feasibility studies. SMEs rarely have the capital to undertake such studies and, as a result, contract with project developers who take on this cost in exchange for a commission or revenue sharing of future carbon revenues generated. There is a risk that the project will not pass the inspection of certification bodies that qualify the credits for sale into either voluntary or compliance markets. This risk is generally borne by the project developer in exchange for a share in the downstream revenues.

Carbon revenues change the dynamics of a small business, forcing rapid expansion in order to maximize future revenues. For example, in the face of competition, a cookstove business in Ghana will have to rapidly saturate the 1.85-million stove market in order to secure future carbon revenues. A target of 80% market share within five years will necessitate the rapid expansion of production capacity to at least 300,000 stoves a year, matched by a simultaneous increase in distribution capabilities. The high upfront demand for cash is likely to outstrip the volume of initial carbon payouts, which are based on prior-year sales volumes, and may require the company to take on additional risk in the form of debt or pre-financing. This is likely to place significant demands on the management capacity and financial aptitude of the proprietors. Realizing cash in the bank from carbon offsets takes about three years from the time one first begins developing the carbon project, and then only arrives every year thereafter. Bridge financing becomes crucial in this intermediate stage, and it is at this point that investors can have the most impact, by providing capital while undertaking a reasonable amount of risk.

Transparent Revenue Sharing Agreements

The transparency of revenue sharing agreements with local entities is key to the long-term sustainability of the carbon market. In the absence of government policy, this is usually done via a negotiation between the SME and the carbon developer. SMEs rarely understand the dynamics of carbon markets or the risks involved and are therefore often unable to negotiate terms to their favor. End-users, the default owner of the credits (for household technologies like cookstoves) are sometimes left out of the carbon contract altogether. While this has led to a few unfavorable situations, it has also resulted in the creation of nongovernmental organization (NGO) sponsored third-party certification standards, such as the Gold Standard, which ensures that projects are developed ethically and meet the highest standards of transparency and good governance.

To mitigate these risks, clear contracts that explained the revenue sharing agreements were signed between TEL and E+Carbon. Contracts between TEL and its customers were also

established. All sales agreements included a note that explained to the customers that they were agreeing to sell their rights to the carbon to TEL in exchange for a product discount. Certification with the Gold Standard was also sought to assure investors that they were receiving high quality credits.

Institutional Capacity across Project Development Life Cycle

The Kyoto Protocol allows polluters in Annex 1 (developed) countries the ability to offset or neutralize their carbon emissions by investing in carbon projects in developing (Annex 2) countries. As a result, a number of enterprising carbon developers have started establishing projects in countries like Ghana and Mali, with the goal of bringing carbon offsets to the European compliance markets. However, the governments and officials in these countries do not always understand complex international treaties and the importance of close government supervision and legal agreements.

Government and Legal Infrastructure. When faced with a lack of clear policy and guidance on how carbon revenues will be taxed or shared with local entities, project developers should conform to the stipulations made by the UN and other certification bodies.

E+Carbon held educational and stakeholder meetings in Ghana and Mali that brought the different parties to the table and explained the costs and benefits of a carbon project to all those involved. Such a transparent process was crucial to securing the buy-in of artisans, government officials, and local NGOs.

Financial and Aggregation Infrastructure. Bringing carbon credits from development to sale through certification, validation, and verification and trading them on international markets requires a sophisticated financial partner. SME carbon projects are usually small-scale (in comparison) and require the services of a carbon finance specialist and an aggregator to achieve the scale necessary for trading in carbon markets. Such services are rarely available locally among financial institutions. Foreign brokers and third-party aggregators are required, which adds to transaction costs.

SME Capacity. Carbon projects have an extremely high implementation risk. The ability of the SME management to grasp the complex third-party requirements of monitoring and verification is crucial to the generation of high quality credits. The need to educate staff across the ranks from sales agents to accountants was crucial to the success of the TEL carbon project. Third-party auditors require the ability to verify that carbon offsets were generated as planned and have to track the amount of carbon offsets to specific program activities (like the number of stoves sold and currently in use). The need for random sampling requires an SME to have in place a sophisticated tracking process and the

capacity to retrieve data from sales in the past. To put this in context, many SMEs lack the ability to even generate financial statements on an annual basis to service their loan covenants. The added burden of carbon monitoring and tracking can be overwhelming and in most cases, impossible.

E+Carbon had to take an extremely hands on, labor-intensive approach to developing the institutional capacity of TEL to manage the carbon certification process. It has built up the technical capability for TEL to monitor sales down to individual customers in each quarter and has navigated the verification process through to registration of credits. This level of support is crucial to the success of a carbon project.

Carbon finance yields streams of revenue that are of a magnitude that some SMEs have never seen before. It creates unique social, cultural, and financial challenges that need to be addressed; for example, how cash flows are shared and distributed both within the SME and within the community in which it operates. E+Carbon's approach of empowering the entrepreneur with capital and technical assistance has proven results, but not all project developers have the same philosophy and many do not have the expertise and/or capacity required to gain trust, develop local businesses, and support entrepreneurs toward longer term sustainability. Technical assistance is therefore an absolutely critical aspect of any carbon project.

Unintended Consequences and Cultural Complexities

Carbon project development is as much an art as it is a science. Project developers write complex methodologies that specify the amount of greenhouse gases that will be offset with their project's activities. However, they cannot always account for cultural nuances and unintended consequences that often complicate project results. E+Carbon's experience in West Africa has yielded interesting observations.

Challenges with Changing Customer Behavior. Projects activities that require customers to make changes to their purchasing behavior or use patterns are often challenging. E+Carbon's cookstove projects required households to surrender old inefficient stoves in favor of newer efficient ones. However, customer use patterns showed that inefficient stoves were used in parallel with the newer ones, resulting in higher emissions than with only efficient stoves. Anecdotal evidence from initial field research in Mali suggests that cultural nuances may prevent the obsolescence of old stoves because many joint-family households simply tend to hold on to their older stoves for sentimental reasons. Similar evidence was obtained through first-hand observations in Ghana, where cultural norms often dictate re-use.

In the E+Carbon project, emissions reduction numbers account for parallel use of old stoves by using a paired Kitchen Performance Test that quantitatively measures reductions of household fuel usage both before and after switching to the efficient cookstove. Stove buyback promotions are also used to act as an incentive to counter this trend. Such considerations are important as investors and developers implement carbon finance to deploy cleaner technologies to households.

The Rebound Effect. Another question pertaining to consumer behavior is the potential magnitude of a rebound effect that is often associated with improvements in energy efficiency. As stoves get more efficient and customers become more affluent, developers need to consider that it is likely that they will start to cook more, thus negating the benefits from more efficient cookstoves. Developers should be aware of this risk and factor their emissions reductions tests accordingly to manage for such risks. E+Carbon's Kitchen Paired Test is designed to measure this change in user behavior.

Pressures of Scale. The availability of carbon finance creates an imperative to reach scale quickly. By saturating the available market, an SME can secure the future generation of carbon credits. This requires it to scale up manufacturing and distribution capacity. For TEL in Ghana, the eventual growth of sales to 300,000 stoves a year, might imply that the company could find it more cost effective to import metal sheets, stove components, or even entire stoves. As Chinese manufacturers bring the cost of cookstoves down, companies like TEL may contract their manufacturing from China. While this choice may be the most efficient use of capital, it may come at the cost of local employment and could endanger the jobs of local artisans who rely on stove metalworking for their livelihoods. Mission-driven investors need to pay attention to these unintended consequences and manage for the outcomes they desire.

Risk Management and Cost Reduction Initiatives

Carbon projects are extremely labor intensive, and certifications like the Gold Standard require detailed and rigorous tracking to verify the generation of credits or offsets. Vendors must maintain sales records that are later used by trained evaluators to follow up with stove owners about their fuel use and cooking habits. The stoves are sold in markets and door-to-door by Toyola "evangelists," individuals who record each sale in a notebook and then are paid on commission. Because 55,000 stoves were sold in 2010, the paper records are becoming increasingly difficult to maintain. As a result, carbon tracking and monitoring is extremely tedious and at times unreliable, given the lack of data.

Building Low-Cost Technology Platforms

As small-scale carbon projects are becoming more common, a few initiatives have started to demonstrate the viability of technology platforms that help aggregate and scale multiple projects. One such development is E+Carbon's deployment of the data collection and communication short message service, known as RAPID SMS, to pilot an SMS-based tracking of end users to facilitate carbon finance auditing. The system, called Carbon Keeper, was built by SMS programming expert Michael Benedict, with support from E+Carbon and others. With this simple technology, TEL evangelists can use fixed-format SMS messages to update a sales database directly from the field. The application was designed primarily to track sales for carbon recordkeeping, but it also offers limited supply chain management and back office functionality. Managers access the database through a web interface that provides aggregated statistics and the option to export an auditor-ready Excel spreadsheet of stoves sold.

This pilot project showed that there is real potential for technology platforms that use RAPID SMS to realize cost savings across the board, both to the SME and to the carbon project developer. Similar technology is now being used by Carbon for Water to collect 40,000 data records a day (Anoka 2011). The data is used to support Vestergaard Frandsen's campaign to distribute LifeStraw Family water treatment units to four million people in Western Kenya.

Sharing Risks and Securing Credit

SMEs often face liquidity constraints across their supply chains. Their supply chains are made up of informal, loose relationships with contract workers who often require up-front cash financing and payment in advance for production. Contract workers, as in the case of TEL in Ghana, are individuals who usually do not own bank accounts, pay taxes, or own any assets. They are often unable to access lines of credit or avail themselves of business loan services from traditional banks or lending agencies.

The inability to access credit impacts cookstove businesses like TEL since they rely on the contract workers to supply them with stove parts and to distribute their product. SMEs often have to provide cash advances before any raw materials can be sourced or before any inventory is produced. On the distribution side, retailers and sales agents also demand credit terms because they do not have cash reserves to finance stock purchases or to invest in distribution infrastructure. Therefore, a business like TEL not only has to provide its stoves on credit terms, but it also has to pay for transportation costs and invest in a transportation fleet. This liquidity challenge is typical for most SMEs operating in this context in West Africa.

As TEL increases the sales of its stoves, it will have capital outstanding from the credit sales to customers. Hypothetically, by the end of a year, TEL could potentially have as much as 250,000 cedis (approximately USD 150,000) worth of capital resting with its customers. This situation creates a very strong business case for partnerships with local rural banks or microfinance institutions that could finance business activities across the SME supply chain. The arrangement not only frees up capital but also allows business risk to be shared with financial institutions that have the capacity to absorb losses.

Such partnerships with MFIs that provide end-user finance are being piloted successfully by entities like ARC Finance and Micro Energy Credits. The pros and cons of the different types of financing arrangements for an SME like TEL are listed in Figure 2. These options should be evaluated for different SMEs, given the specific in-country context, the maturity of MFIs, and the availability of rural credit.

Figure 2: Evaluating Different MFI Financing Arrangements for SME (TEL)

	End-User Finance	MFI as Point of Sale	Financing Sales Agents
How It Works	<ul style="list-style-type: none"> Introduce customer to an MFI that finances the up-front purchase of product in exchange for repayments over time + commission. 	<ul style="list-style-type: none"> MFI purchase stoves from TEL and acts as distributor or point of sale. MFI offer stove on credit or free to self-identified customers. 	<ul style="list-style-type: none"> MFIs provide credit to sales agents and evangelists, identified by TEL. Sales agents and evangelists take on risk of repayment.
Pros	<ul style="list-style-type: none"> Builds credit history of customer Reduces TEL's credit risk 	<ul style="list-style-type: none"> Creates a new point of sale at MFI bank branches Gives immediate cash to TEL for the stove sold 	<ul style="list-style-type: none"> Addresses liquidity concern of current distribution model Transfers risk from TEL to the sales agent/evangelist
Cons	<ul style="list-style-type: none"> Scale of MFIs is inadequate to serve all TEL clients. TEL's target clients might be too risky for MFIs. Administrative costs for MFI are too high for low priced stoves. 	<ul style="list-style-type: none"> Does not address the system-wide lack of liquidity Banks might use stoves for their own promotions as a give-away and distort the market. Unlikely to be able to match TEL sales volume 	<ul style="list-style-type: none"> TEL will likely be asked to act as a guarantor for a loan to sales agents. MFI interest rate may be prohibitively high for sales agents.

Source: Amrita Vijay Kumar, 2009.

Conclusion

As small-scale, distributed, and programmatic carbon projects start to generate credits for investors like E+Carbon, they will undoubtedly start to gain acceptance among the broader investment and development community. It is critical that they do not lose their core attributes—transparency, local community buy-in, fair revenue sharing agreements, and long-term financial sustainability. Investors need to pay special attention to the key risks and challenges highlighted in the research while they perform due diligence across all aspects of the project life cycle in order to gain confidence that their investments are both socially responsible and financially viable.

Acknowledgments

This work would not have been possible without support, and invaluable instruction from Erik Wurster, formerly of E+Carbon. Thanks also to Christine Eibs-Singer for allowing me the opportunity to work with E+CO and to the E+CO staff in New Jersey and Ghana for their hospitality and for generously sharing their time and wealth of knowledge; Suraj Wahab, CEO of Toyola Enterprises Ltd for his persevering spirit, hospitality, and bottomless well of patience; Bill Ford, Yale, SOM 2010, for sharing his time, intellect, and invaluable language skills over the summer of 2009.

A debt of gratitude is owed to all the individuals who freely contributed their time and knowledge to this research: Stephen Lee (AIDG), Matt Evans (CEIHD), Todd Albi (STOVE TEC), Wisdom Togobo (Ministry of Energy, Ghana), Margaret A (CSIR), Frank Atta-Owuso (KITE), GHAMFIN, Ghana Microfinance Network, Vincent Yankey (E+Co Ghana), Jesse (Ugastoves), and Todd Woffchuck (Berkely Air).

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Biography

Amrita Kumar enjoys working at the intersection of finance, business, and sustainability. She has worked with organizations across the public and private sector to identify, finance, and scale their triple bottom-line initiatives. She is an advocate of using private investments as a tool to enable social and environmental change, a product of her experiences with Piper Jaffray, the Environmental Defense Fund, Citigroup Growth Ventures, and E+Co, a social venture fund that channels investments to environmental entrepreneurs. She has also worked on pioneering carbon finance projects that have helped prevent deforestation in Indonesia and have scaled cookstove businesses in West Africa. Previously, Amrita was an Assistant Manager with PricewaterhouseCoopers in Singapore. She is a recent Fellow of the Erb Institute for Global Sustainable Enterprise and graduated from the University of Michigan in 2011 with an MBA and an MS in Natural Resources.