Landscape Study of Investment Funds Investing in Fecal Sludge and Resource Recovery in Sub-Saharan Africa

External report

SANGEETA CHOWDHRY
Consultant

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Executive Summary

This report is a landscaping study of investors funding fecal sludge to energy enterprises in Africa, sponsored by the Bill & Melinda Gates Foundation. In gathering information for this study, I spoke with the senior staff of 36 organizations to get their take on what the issues and needs in the sector were. These organizations included a variety of investors as well as a handful of implementing organizations.

The report submitted to the Foundation contained investment details and strategies of these investors and market analysis based on the conversations with them. For this external version of the report that is to be shared publicly, all information about the funders that is not publicly available has been removed. As such, the sections in this report containing information about the funders provide only publicly available information from their website. The purpose of including this here is only to provide reference to the names and diversity of the investors in this space. The sections on sector overview and recommendations have been written after incorporating the comments of the funders.

There were some common themes that emerged from the conversations with the investors. The most significant one being that there are simply not enough businesses in the waste-to-energy sector to attract investments – and businesses are almost non-existent in the fecal waste to energy area. The investments that are being made are opportunistic in nature, rather than systemic. Even impact investors doing water, sanitation and hygiene (WASH) and renewable energy sector funding, are not actively seeking waste-to-energy deals.

Most of the renewable energy investments are being done in solar-technology based products and services. There is opportunity in micro-hydro projects and large wind farms. Opportunity also exists in solid-waste collection and recycling projects – although this sub-sector seems to be challenged by concerns of corruption at the local municipal level and informal 'mafia' control of the collection in some cities, making it difficult for entrepreneurs to enter the market.

Enterprises that are targeting the poor through waste-to-energy innovation are either using agricultural or animal waste as their feedstock. Human waste-to-energy projects are limited to household level biogas plants, the likes of which are being implemented by SNV across Africa and Asia, or are being tried out at an institutional level such as in the prison system or schools in Rwanda. The most commonly referred to social enterprises by the funders were Sanergy in Kenya (mentioned by most), Waste Enterprisers in Ghana and Emergence Bioenergy in Bangladesh.

The only type of funding that is engaged in trying to create a market, is one that is targeting business plan competitions. Again, this is not waste-to-energy specific, but can be inclusive of that. Several interesting competition models are being executed by the likes of BiD Network, Africa Enterprise Challenge Fund (AECF) and Global Village Energy Partnership (GVEP) and will be discussed in detail in the following section of this report.

The main challenges in market creation and growth of commercial waste-to-energy enterprises, as highlighted by the funders were:

1. Lack of an understanding of the economic model based on actual data. This included challenges in reliability of input feedstock and market size for outputs. With clear and viable business models of enterprises based on solar technology available, for instance, investors (private equity and impact) were finding it easier and preferable to invest in those opportunities for their cleantech portfolios.

2. Lack of supportive regulatory mechanisms

3. Need for more seed funding – not impact funding – and support for the entrepreneurs to help them commercialize their ideas

4. The focus on biogas to electricity was seen as somewhat limiting, with a need to evaluate business models for other outputs of waste.

The issue was thus not one of a lack of capital – as there was funding available from a range of investors (philanthropic funders to impact investors to private equity investors). Rather, the issue was a lack of "investable" deals and understanding of business models that could operate within the regulatory frameworks of various countries in Africa.

Scope of Project

The objective of this assignment was to landscape the funders that are willing to invest in fecal sludge to energy projects in Sub-Saharan Africa. A benchmark analysis of the various investment funds was to be provided along with recommendations for follow up by the Foundation and other donors of how to cultivate the market-based finance into the fecal sludge to energy market.

The funders considered for the study included the spectrum of those providing philanthropic funding through grants to commercial private equity investors. Recognizing that there will not be too many funds that focus on fecal sludge to energy, it was also decided to expand the search to include funders investing in the clean tech sector.

The scope of this study was to focus on the investors rather than on any specific waste to energy (W2E) projects or technologies.

Overview

Base of the pyramid (BoP) households spend 7% of their expenditure in meeting their energy needs, leading to a worldwide BoP energy market of $433 billion.[1]
IFMR Research Center for Development Finance and World Resource Institute, estimate the potential market for decentralized renewable energy enterprises (electricity from hydro, biomass) for the rural poor in India alone to be $2 billion a year.[2] Yet, according to a recent study by J. P Morgan on impact investing[3], of all sectors targeted by the impact investment community, investing in energy accounted for only 5% of all deals (microfinance had the highest at 28%), and at $94M, accounted for only 4% of the invested capital.

Clean energy funding in Africa covers a wide scale and range of products and services – home solar systems, energy efficient cook stoves, solar lanterns, wind farms, hydro and biomass generated electricity. There is a diversity of funders targeting investments in the clean energy sector that can be assigned to four main categories:

- Philanthropic Grant-Making: providing project based grants
- Philanthropic Competition: providing funding for competitions
- Impact Investors: Impact funder, with double or triple bottom lines; and
- Commercial Investors: Commercial capital like private equity and debt

The commercial investors in the renewable energy sector, are looking at good 'deals' to be had in the sphere of large viable solar, wind, hydro, biomass-to-energy and energy-efficiency businesses. The interest is not driven by providing services to the poor, but rather the availability of international capital to address climate change and the opportunity presented by a large energy market.

Impact investors, while looking for social returns in addition to financial returns, are also going after social enterprises that have the most chance of commercial success. That is not where the waste-to-energy (W2E) enterprises are at the moment. So while the commercial investors fund large solar, hydro or wind farms, the impact investors too are funding enterprises that are off-grid solar or hydro projects and to a very limited extent agricultural waste-to-energy projects. For example, exactly half of E+CO's clean energy investment portfolio is based on solar technology products and services.

What was interesting to note was that while there is a good mix of philanthropic and investment capital that has been operating in this space, a large number of new investors – not donors - are entering the space.

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[1] "*The Next 4 Billion: Market size and Business Strategy at the Base of the Pyramid",* IFC and World Resources Institute, 2007

[2] *Power to the People: Investing in Clean Energy for the Base of the Pyramid in India,* IFMR Research-Centre for Development Finance and the World Resource Institute, October 2010

[3] "*Impact Investments: An emerging asset class*", J.P. Morgan, The Rockefeller Foundation and GIIN, November 2010

Private equity investors, looking for commercial deals in the space are investing upwards of several million dollars, while the impact investors provide equity or debt typically of the order of $100,000 to about $3 million. Business plan competition funding was surprisingly high at a maximum of $1.5M by AECF and $5M by Bid Network.

Over and over again, the comments from the funders were that the reasons for lack of commercial enterprises in waste-to-energy, with or without fecal sludge – were *not* lack of finance or technology, but:

- Lack of an understanding of the economic model based on actual data; and
- Lack of supportive regulatory mechanisms

The lack of knowledge of the economics of the enterprise and the business model include not knowing the real costs of input and market value of the outputs. Multiple funders mentioned the challenge of accessing reliable input streams. For example, they have seen businesses struggling to ensure stable supply in terms of volume and consistency of the feedstock. Efficiency of collection vis-à-vis transportation costs was not optimized. On the other side of the value chain, there was not a clear understanding of the market size, especially when looking at a product like electricity that was not replacing an existing one, or one like compost that was (i.e. replacing fertilizer), but its comparative advantage regarding quality or price was unclear. Carbon market uncertainty was compounding the difficulty of attempting to have diverse revenue streams to create viable enterprises.

Not knowing the reliability of feedstock or size of the market, then leads to the challenge of operations i.e. What size plant to install? What technology to use? What is the utilization of equipment needed to breakeven?

According to the IFMR study, the challenge in realizing the rural market potential was in correctly estimating the demand to optimize the plant size and load.

Regulatory issues raised were around negotiating power purchasing agreements, creating feed in tariffs, access to land rights and governmental subsidies distorting markets.

Besides these hurdles, the other common issues mentioned by many were:

- Need for more seed funding – not impact funding – and support to the entrepreneurs to help them commercialize their ideas
- The focus on biogas to electricity as limiting and the need to evaluate models for other outputs of waste.

Funders Interviewed

Acumen Fund	
Sector Focus	Agriculture, Energy, Health, Housing, Water
Geography Focus	India, Pakistan, East Africa, West Africa

Acumen Fund was incorporated on April 1, 2001, with seed capital from the Rockefeller Foundation, Cisco Systems Foundation and three individual philanthropists. With a mission to create a world beyond poverty, Acumen Fund invests in social enterprises that provide critical services – water, health, housing, and energy – at affordable prices to people earning less than four dollars a day.

As a not-for-profit impact investor, the key to investment is patient capital. Acumen uses philanthropic capital to make investments – loans or equity, not grants – that yield both financial and social returns. Financial returns received are subsequently recycled into new investments.

Acumen Fund makes debt or equity investments in early-stage enterprises providing low-income consumers with access to healthcare, water, housing, alternative energy, or agricultural inputs. Typical funding commitments for an enterprise range from $300,000 to $2,500,000 in equity or debt with payback or exit in roughly seven to ten years. The "patient capital" Acumen provides is accompanied by a wide range of management support services to nurture the company to scale.

Investment criteria are:

- Potential for significant social impact: Delivery of the products or services should generate social outputs that compares favorably with products or services either currently available on the market or through charitable distribution channels.
- Potential for financial sustainability: A clear business model that shows potential for financial sustainability within a five to seven year period, including the ability to cover operating expenses with operating revenues.
- Potential to achieve scale: An objective of reaching approximately one million end users within a five year period with the benefits of the product or service

Acumen Fund tracks the financial, operational, and social data of portfolio companies across different geographies and industries on a metrics platform called Pulse, created in collaboration with Salesforce.com and Google.org. Metrics data are collected monthly or quarterly to help assess the real-time health and impact of the portfolio companies. In addition to the ongoing tracking system, Acumen has also collaborated with key partners in the impact investing community to develop a set of industry standards called the Impact Reporting and Investment Standards (IRIS), which will transform the way impact investors measure and evaluate their investments. With these standards, it will be possible to aggregate sector-wide data, analyze it and compare it across organizations, providing transparency for investors and organizations to maximize investment potential.

At the close of it's first decade, Acumen Fund has approved investments of more than $72 million in 65 companies, with a goal to grow the portfolio to $150M in the next five years, touching the lives of 150 million people. The energy portfolio at Acumen was launched in 2007 with a focus on:

- Energy appliances at the household level: including LED lamps; cook stoves; and solar- and human-powered products
- Community-level power generation systems: including village bio-gasification, solar and small-scale hydro and wind power.

The waste to energy investment has been in Husk Power Systems (HPS) in India. The company takes agricultural waste, rice husks otherwise left to rot, and converts it into gas that powers an off-the-shelf turbine to generate electricity. Each HPS plant serves two to four villages. User fees depend on the number and type of electrical appliances subscribers own.

Energy, Environment and Development Network for Africa (AFREPREN/FWD)

Sector Focus	Renewables and energy for rural areas, energy sector reform, energy services for urban poor, gender and energy
Geography Focus	Africa

Energy, Environment and Development Network for Africa (AFREPREN/FWD) is a Kenya based NGO that brings together African energy practitioners, professionals, researchers, investors and policy makers from Africa who have a long-term interest in the development of cleaner energy services for Africa as well as energy research/capacity building. The key objective of AFREPREN/FWD is to strengthen African expertise, capabilities, skills and research capacity and in the service of cleaner and affordable energy service for the poor in Africa and associated energy policy-making and planning.

Initiated in 1987, AFREPREN/FWD is a collective regional response to the widespread concern over the weak link between African energy skills/research/expertise and the development and implementation of cleaner energy investments and energy policy in Africa. Over the last 10 years, AFREPREN/FWD has expanded its scope of operations to include promotion of sustainable energy investments. This has entailed forging closer relations with developments banks such as the African Development Bank and privates sector in Africa.

Some examples of their energy projects include "Cogen for Africa" which is an innovative and first-of-its kind-regional initiative funded by the Global Environment Facility (GEF) designed to support small, medium and large-scale industries in Africa to develop their cogeneration potential. This initiative is supported by the GEF via the United Nations Environment Programme (UNEP) and the African Development Bank (AfDB). Another project is Capacity Building for Renewable Energy SMEs in Africa (CABURESA), which is an initiative of the Danish International Development Agency (DANIDA) and AFREPREN/FWD, with an overall objective to strengthen existing and embryonic sub-Saharan African SMEs, and related key stakeholders involved in pro-poor renewables development through training and investment support.

Africa Enterprise Challenge Fund (AECF)

Sector Focus	Renewable Energy, Agriculture
Geography Focus	Africa

The Africa Enterprise Challenge Fund (AECF) is a US$150m private sector fund, backed by some of the biggest names in development finance and hosted by the Alliance for a Green Revolution in Africa (AGRA). The Africa Enterprise Challenge Fund provides grants and interest free loans to businesses that wish to implement innovative, commercial viable, high impact projects in Africa. The AECF supports businesses working in agriculture, financial services, renewable energy and technologies for adapting to climate change.

Applications are assessed during competitive rounds which each have their own entry criteria. Winners can receive up to US $ 1.5 million. The competition is open to companies from anywhere in the world provided the business idea is implemented in Africa.

The AECF's Renewable Energy and Adaptation to Climate Change Technology (REACT) Window is a special fund of the AECF that is open to business ideas based on renewable energy and adaptation to climate technologies. The REACT window is a competition, open only to for-profit companies. Successful applicants receive grants and interest free repayable grants up to a maximum of US$ 1.5 million.

AECF's REACT funding window is designed to catalyze private sector investment and innovation in low cost, clean energy and climate change technologies. The fund supports:

- Private sector energy providers to invest in and supply low cost, clean energy to rural households and businesses that have little hope of accessing power from the grid. This includes cost effective renewable power, commercially viable fuels and other clean energy alternatives.
- Agri-business and other private sector players to provide innovative solutions to climate variability that help small-holder farmers to adapt to climate change

BiD Network

Sector Focus	All
Geography Focus	Global

BiD Network focuses on high growth businesses based in developing countries with a financing need of US$10,000 to US$5,000,000 over the next five years. It provides professional services to entrepreneurs, coaches, investors, business angels and SME service providers. An international network of partners makes this possible with partners active in 16 countries. It aims to start, grow and finance entrepreneurs in emerging markets with a mission to get 5 businesses started or grown per day. (Currently they help two per week).

The BiD network connects entrepreneurs, coaches and financiers with eachother. Entrepreneurs are guided in writing their business plan. They can receive advice from coaches The best entrepreneurs are then presented to registered financiers. Bid Network aims to start and grow businesses in emerging markets, create job through these businesses and mobilize private capital to these businesses.

The BiD Network is a worldwide online community of over 40,000 members, entrepreneurs, coaches, financiers and partner organizations. Through business plan competition for emerging market entrepreneurs– "BiD Challenge" – BiD Network helps identify promising entrepreneurs, expose them internationally, and connect them with potential financiers. 900 professionals worldwide volunteer to coach entrepreneurs on their business plans. It also provides training modules for SME entrepreneurs in all aspects of business and financial planning.

All entrepreneurs undergo a rigorous selection process. Of the 10,000+ business proposals, 3500+ business plans are received. Approximately 1000 (10%) will make it through the selection of Bid Network's Investor Matchmaking department. Since 2008 they have made over 90 matches for $12 million in loans and equity.

Clinton Foundation: Clinton Climate Initiative

Sector Focus	Emission reduction in cities; clean energy, waste, low carbon transportation, forestry
Geography Focus	Global

Clinton Climate Initiative (CCI) creates and advances solutions to the core issues driving climate change. CCI takes a holistic approach, addressing the major sources of greenhouse gas emissions and the people, policies, and practices that impact them. CCI operates at the nexus of business, politics, and environmental groups on reducing carbon emissions in cities, increasing energy efficiency through building retrofits, catalyzing the large-scale supply of clean energy, and working to stop deforestation.

Through targeted projects, including building retrofits, outdoor lighting, and waste management, CCI helps municipal governments improve energy efficiency and reduce emissions. The CCI Clean Energy program advises governments on the development and implementation of strategies, policies, and incentives supporting solar-energy projects and carbon capture and storage. The CCI Cities Program provides project management assistance, financial advice, technical assistance and purchasing assistance to the project partners. CCI's Waste Management Program supports practical action to reduce and prevent greenhouse gas emissions from municipal solid waste. Areas of focus are capturing of methane from landfills, recycle commodities and municipal infrastructure needed to collect, process and market recyclable commodities.

DI Frontier Market Energy & Carbon Fund

Sector Focus	Renewable energy and carbon credit generating assets
Geography Focus	Eastern and Southern Africa

Frontier Investment Management is a Danish based private equity fund manager of DI Frontier Market Energy & Carbon Fund, focused on renewable energy investments in Sub-Saharan Africa. DI Frontier Market Energy & Carbon Fund (the Fund) is a EUR 60m Danish based investment fund with a focus on renewable energy and carbon credit generating assets in less developed emerging markets in Sub-Saharan Africa. The investor base includes European and African institutional investors and Development Finance Institutions. The Fund has a focus on Eastern and Southern Africa. Core focus countries include: Kenya, Mozambique, Tanzania, Uganda and Zambia. However, developers from any country in Sub-Saharan Africa are welcome to submit proposals

The Fund is characterized by a novel investment strategy and approach that sets it apart from the way most funds work. The main distinguishing feature is an integrated approach to project development, investment, and carbon trade. This means that the Fund may participate actively in the development of projects from a very early stage. However, the Fund is also open to investments in mature projects.

DI Frontier Market Energy & Carbon Fund invests in renewable energy and energy efficiency projects that contribute to reducing green house gas emissions. Projects may be standalone such as wind farms or captive such as bagasse based power generation at sugar factories.

The Fund has a preference for projects with a total investment between EUR 5-100m. The Fund may commit EUR 3-10m to a single investment using several instruments such as: equity, mezzanine capital (e.g. convertible debt or preferred shares), carbon credit Prepayment and short term debt financing

All investments must be related to specific energy projects and assets. The Fund has a medium to long term perspective on its investments with a typical investment horizon of 5-10 years.

E+Co

Sector Focus	Clean energy
Geography Focus	Africa, Asia, Latin America

E+Co makes clean energy investments in small and medium enterprises in developing countries. With 15 years of experience and offices in 8 locations, E+Co's innovative business model provides lasting solutions to climate change and poverty. E+Co invests seed and growth capital to create and expand sustainable renewable energy businesses in Africa, Asia and Latin America. E+Co does not provide grants, but rather makes loans and equity investments in cleaner energy enterprises. Loans must be repaid with interest. It is E+Co's objective to establish financially sustainable clean energy businesses. Its investments range in size from approximately US$25,000 to US$1,000,000. Founded in 1994, E+Co is an impact investor investing making clean energy investments in Africa, Asia and Latin America. According to its 2010 annual report, since 1994 E+CO has funded 287 energy enterprises across 36 countries totaling $45 million. It currently manages over 150 active equity or debt investments in 21 countries.

Most of E+CO's funding is in the form of debt - 86% of its investments in 2010 were through debt and only 7% via equity. Majority of the investments are made in Africa (58%) and the rest evenly divided between Asia and Latin America. The energy sectors E+Co has invested in have been based on solar technology primarily (half of their portfolio is solar focused), followed by biomass (14%), energy efficiency (11%), hydro (11%), liquid petroleum gas (7%), and biogas (7%).

E+Co monitors all investments along a Triple Bottom Line – effectively ensuring that all investments produce positive social, environmental and financial impacts for people and planet.

ERM Low Carbon Enterprise Fund

Sector Focus	Low carbon technological alternatives and forest-friendly livelihood ventures
Geography Focus	Africa, Asia, Latin America

The Low Carbon Enterprise Fund (LCEF) was established to support social entrepreneurs in developing countries whose replicable low carbon products and services replace high carbon alternatives. It provides technical, management and financial support to the ventures as well as to NGOs. The fund sits within the ERM Foundation - a not-for-profit charity – and provides finance in the form of loans and equity stakes to entrepreneurs (not grants) in emerging markets. All monies received back to the fund are re-invested into new low carbon ventures.

In parallel, the LCEF also provides pro-bono specialist advice on technical and business issues to support such ventures. ERM, the global consultancy, has provided support for this program as part of its Low Carbon Initiative, and has financed all of the administrative, technical and pro-bono work that enables the Low Carbon Enterprise Fund to operate.

LECF has supported over 65 ventures in total, through financial and/or technical assistance with 42% of its investment portfolio in Africa, 42% in Asia and 16% in South America. Some of the investments made by LCEF have been in bio-fuel from jatropha plants in Madagascar, energy efficient burners in India, fuel efficient bricks in Tanzania and pico hydro technology in Indonesia.

First Light Ventures

Sector Focus	Environment, Education, Health, Poverty Alleviation
Geography Focus	Global, but focus on India, Kenya, US

First Light Ventures is an independent fund started in 2009, within the Gray Ghost Ventures family of initiatives. The fund serves as an incubator and investment partner to seed-stage, for-profit social ventures. FLV's unique investment strategy is designed to accelerate the successful development of scalable and sustainable social enterprises that provide goods and services to low-income customers in emerging markets around the world. FLV distinguishes itself by focusing on pilot or proof-of-concept-stage business models and is characterized by small deal size, high volume, and tolerance for the risks associated with seed-stage investing.

Among the investments made in the environmental portfolio are:

a) TerViva BioEnergy has developed an ultra-low cost, environmentally responsible feedstock for the production of biodiesel. TerViva owns a proprietary strain of the pongamia tree, which grows in marginal soil and requires little water or fertilizer.

b) CO2 Impact is a carbon project developer focused on carbon-offset programs that have an impact on local communities in Latin America. CO2 Impact is converting brick kilns from coal to gas across Latin America to reduce emissions. The carbon credits that are generated from the projects will be sold and the revenue used to support the local communities.

Global Energy Efficiency and Renewable Energy Fund (GEEREF)	
Sector Focus	Renewable energy and energy efficiency
Geography Focus	Emerging markets, priority to Least Developed Countries

The Global Energy Efficiency and Renewable Energy Fund (GEEREF) is an innovative Fund-of-Funds, providing global risk capital through private investment for energy efficiency and renewable energy projects in developing countries and economies in transition. It aims to accelerate the transfer, development, use and enforcement of environmentally sound technologies for the world's poorer regions, helping to bring secure, clean and affordable energy to local people.

GEEREF is registered as an instrument qualifying as Official Development Aid (ODA) by the Organization for Economic Co-operation and Development OECD Development Assistance Committee. It is sponsored by the European Union, Germany and Norway and is advised by the European Investment Bank Group, with a target funding size of €200-250 million. It aims to catalyze the mobilization of public and private capital (equity and debt), and estimates that up to €1 billion could be mobilized through the funds in which GEEREF will participate and the final projects in which these funds will invest.

GEEREF's beneficiaries are small and medium size (i.e. € 5-10 million) renewable energy and energy efficiency projects and enterprises in developing countries and economies in transition. GEEREF gives priority to those funds that invest in renewable energy (including hydro, solar, wind and biomass), solar heaters/cookers/pasteurizers, wind pumps and improved cook stoves. GEEREF may work with alongside with microfinance institutions to achieve its objectives.

Structured as a Fund-of-Funds, GEEREF invests in private equity funds that specialize in providing equity finance to small and medium-sized project developers and enterprises (SMEs). The private equity funds should focus on projects requiring up to €10 million equity investment and fulfilling a substantial gap in the market. GEEREF does not directly provide funding to renewable energy and energy efficiency projects or enterprises.

GEEREF invests exclusively in emerging markets outside the European Union and particularly focuses on serving the needs of African, Caribbean and Pacific developing countries. Priority is given to investment in countries with policies and regulatory frameworks on energy efficiency and renewable energy.

Global Village Energy Partnership (GVEP)

Sector Focus	Access to energy
Geography Focus	Africa, Latin America, Caribbean

The Global Village Energy Partnership (GVEP), is a non-profit organization that works to increase access to modern energy and reduce poverty in developing countries. GVEP works with local businesses to help establish and grow small and medium size energy businesses in rural and poor peri-urban areas so that they can achieve lasting access to clean energy. They provide SMEs with technical and business advice and link them with financial institutions to access the capital they need to deliver real results in their communities.

Specific programs and competitions help GVEP meet the needs of energy entrepreneurs providing them with grants, investments and business plan advice and the impetus to develop and improve their businesses. Programs managed by GVEP are:

- Developing Energy Enterprises Programme (DEEP) for training and mentoring over 900 micro entrepreneurs in East Africa.

- Loan Guarantee Fund encouraging the flow of credit by underwriting loans to energy businesses in East Africa.

- Supporting energy SMEs in Sub-Saharan Africa, a $30 million program providing technical and financial assistance to small and medium enterprises.

- Energy Access Finance Fund raising a new fund (Prometheus Clean Energy Fund) to invest in energy companies. The Fund will target investments in companies and projects utilizing renewable energy technologies in sub-Saharan Africa. The Fund will target investments of €500,000 to €5 million and require investees to demonstrate not only financial viability, but also significant and measurable social and environmental impacts. It will consider opportunities to invest in generation projects such as hydroelectric and wind facilities, as well as companies which provide products to the base of the pyramid, such as solar product and cook stove manufacturers and distributors. Prometheus is a key initiative to leveraging GVEP's donor-funded support with private sector capital to generate even more scalable impact.

- Business plan contests to award financial and technical help, such as the IDEAS Energy Innovation Contest and the Access to Clean Energy Challenge East Africa, run in tandem with the BiD Network. For the IDEAS competition, GVEP received over 1,000 business proposals from 28 countries in Latin America and the Caribbean. 26 winners were selected and each received a two-year development grant of up to US$200,000. The Access to Clean Energy Challenge in 2009 was a competition for business energy ideas aimed at delivering access to clean energy to people in East Africa. The winners were eligible to receive coaching on the development of their business idea, and the best of the business plans received a mix of grant support and investment.

Gray Ghost Ventures

Sector Focus	Social ventures, microfinance, education
Geography Focus	Global

Gray Ghost Ventures (GGV) is an impact investment firm dedicated to providing market-based capital solutions to entrepreneurs who are addressing the needs of low-income communities in emerging markets. GGV's focus areas include: microfinance, social venture investment and affordable private schools.

The Social Venture Group manages the mission-related portfolio for Gray Matters Capital and the Gray Ghost DOEN Social Ventures Coöperatief . Gray Matters Capital (GMC) foundation created a $10 million mission-related investment portfolio. Beginning in 2006 GMC invested in eight early-stage businesses providing goods, services and financial access to low-income populations. The pool of capital is fully invested. Among its investments have been d.light Design (low-cost solar powered lanterns), Emergence Bioenergy (waste-to-energy). The Gray Ghost DOEN Social Ventures Coöperatief is a $35 million social venture fund targeting investments that create social and economic value. The fund is registered in Amsterdam and has been operational since late December 2008. It is currently an active fund that is seeking to invest in transformable, scalable and impactful socially conscious business opportunities.

Gray Matter Capital is fully invested in eight early stage businesses
Investments are heavily biased towards South Asia (two-thirds), while the rest for Africa and Latin America and have a team based in India that drives the Asian investments. . They also have a strong leaning toward with mobile technology sector, with two-thirds of their investments in this field.

Hystra

Sector Focus	Water, Agriculture, Health, ICT, Nutrition, Energy, Housing, Financing, Social Investing
Geography Focus	Global

Hystra is a consulting firm working with large corporations, NGOs, Foundations and governments, to help identify and scale sustainable social innovations by incorporating them in the strategies of the private sector corporations. Their target is to solve social problems at scale for the BoP through large corporations as lever. Hystra works with business and social sector pioneers to design and implement hybrid strategies, innovative business approaches that are profitable, scalable and eradicate social and environmental problems.

They expect their clients to embrace an open source philosophy and allow Hystra to share all (non-confidential) insights and methodologies.

Hystra published a report titled "Access to Energy for the BOP" which was the result of a consulting assignment undertaken for three energy corporations: GDF SUEZ, Schneider Electric and Total. The report analyzes projects serving the poorest, and that are economically viable and scalable. It presents solutions to provide electricity to the 1.6billion that still don't have it and looks for alternatives for the many who still cook with biomass.

IFC Cleantech innovation Facility

Sector Focus	Renewable energy and energy efficiency; waste management, water, green buildings, eco-efficiency
Geography Focus	Global

The International Finance Corporation (IFC) is launching the Cleantech Innovation Facility (CTIF), a $60 million financial mechanism to support alternative business models in developing countries aiming to reduce carbon gas emissions. The facility will invest equity or quasi-equity in early stage cleantech companies.

The project is co-sponsored by the IFC and the IFC-GEF Earth Fund. The CTIF will grant venture stage companies in emerging markets with the strategy and tools required in their efforts to provide products and services aimed at reducing carbon gas emissions. The companies targeted will originate or move to developing countries and have potential for scale but are unable to access commercial finance.

The CTIF will target companies that are innovative in terms of technology or business models across a broad spectrum of sectors, including clean energy, transportation, water, waste, building and energy efficiency, and will contribute towards greenhouse gas emission avoidance and increased access to modern, healthy energy and water services, among others. IFC's investment in the alternative business models is expected to range between $3-4 million, with a maximum exposure of $10 million.

Industrial Development Corporation	
Sector Focus	Industrial development – Green industry, agriculture, manufacturing etc
Geography Focus	Southern Africa, with focus on South Africa

Established in 1940, the Industrial Development Corporation (IDC) is South Africa's national development finance institution set up to promote economic growth and industrial development. The IDC's primary objectives are to contribute to the creation of balanced, sustainable economic growth in South Africa and on the rest of the continent.

IDC's Development Funds Department provides funding support to projects that have a high developmental impact. Among the funds managed by IDC, is the Green Energy Efficiency Fund (GEEF). The Green Energy efficiency Fund provides loans between $120,000 to $6 million at prime less 2% rate with a term up to 15 years. To encourage these projects, GEEF provides pre-screening of applications within a week and also provide technical support to the eligible enterprises through local and international technical experts. Assistance can include performing energy assessments and audits to propose sustainable energy solutions and support the preparation of investment project proposals, as well as calculating the economic and financial benefits of the proposed investment.

Among the funded cases is an investment in a co-generation plant that uses waste gas as fuel to reduce the reliance on grid supplied electricity.

In addition to the GEEF, IDC is also investing over $1 billion over the next five years through its Gro-E Scheme in green industries which includes renewable energy, waste management, recycling, biofuels, agro-processing and others. This scheme works by funding businesses at prime less 3% for loans and the Real After Tax Internal Rate of Return (RATIRR) of 5% for equity financing. A minimum of ~ $120,000 will be funded per project.

InfoDev: Climate Innovation Centers	
Sector Focus	Off grid technologies, bio-energies, water management, micro-hydro, adaptation technologies
Geography Focus	Global; Starting with Kenya and India

The World Bank Group's infoDev is designing and launching a network of Climate Innovation Centers (CICs) to accelerate the development, deployment, and transfer of locally relevant climate technologies. The CICs boost developing country Green Growth and job creation by financing and supporting the competitive and profitable involvement of cleantech SMEs in local and international supply-chains and markets.

infoDev's vision is to create a global network of CICs that promote business-to-business linkages, enhance knowledge sharing and facilitate trade and export opportunities. The network is expected to create over 2,400 enterprises, generate 240,000 direct and indirect jobs, install 3000 MW of off-grid energy capacity, provide energy access to over 28 million people, deliver clean water to over 10 million households and mitigate 65 million tons of CO2. Business plans for CICs have been developed in Kenya and India and are underway in a number of other markets globally.

infoDev's will establish individual centers but also, importantly, network these centers to one another to ensure that best practices are shared, new markets are opened and technologies and applications are commercialized across borders. The Climate Innovation Centers will support innovation and entrepreneurship by offering a full suite of financing and capacity building services to support climate technology commercialization.

Invested Development

Sector Focus	Alternative Energy, Mobile Technology
Geography Focus	Emerging markets

Invested Development is an impact investment firm with a mission to reduce poverty in emerging markets through risk capital investments in the most innovative alternative energy and mobile technology startups. They invest in seed stage, for-profit social enterprises with innovative solutions to poverty in mobile technology and alternative energy. The technologies must create an impact for the underserved in emerging markets, with a particular focus on Africa, India, and Latin America.

Invested Development offers early stage startups seed funding, mentorship, industry contacts and access to a growing network of service providers and innovators. Their investment criteria is funding of high growth, for-profit impact ventures that are at the seed stage, with equity investments ranging from $100,000 to $1,000,000.

Khosla Impact Ventures

Sector Focus	All
Geography Focus	India, East Africa for now

Khosla Impact's mission is to assist entrepreneurs developing market-based solutions to poverty. It invests in world-class entrepreneurs who are passionate about solving challenging socio-economic problems through careful application of science, technology, and design or through creative business models. Khosla Impact believes in experimentation and encourages this approach among their entrepreneurs.

They evaluate a wide range of opportunities but are primarily focused on for-profit enterprises serving people at the bottom half of the world's economic pyramid: low-income laborers, farmers and families, as well as small businesses in emerging markets.

South Asia is their initial, but not exclusive, geography of focus, and welcome entrepreneurs and business plans from all countries and regions. At present, their portfolio includes investments in water, healthcare, agriculture and information platforms.

A venture that Khosla Impact invests in offers one or more of the following factors:

- targets a vast and crucial problem that affects millions of vulnerable people, and by way of business model, turns this problem into a market.
- has achieved new and substantial product design or technology innovation based on research-driven, ethnographic insights.
- enables radically new unit economics that could destroy a monopoly, or obviate traditional means of resource allocation.
- has the potential to improve the ROI of low-income people, or meaningfully reduce their expenses.
- has high scalability with limited capital intensity.
- the risks are identified (to the extent possible) upfront.

Rockefeller Foundation	
Sector Focus	Climate & Environment, Health, Urbanization, Social and Economic Security, Basic Survival Safeguards
Geography Focus	Global

The Rockefeller Foundation has worked around the globe since it's founding in 1913. The Foundation focuses its resources and energies on five interconnected issue areas; climate & environment, urbanization, global health, social & economic security and basic survival safeguards. There are several strategic principles that guide the Foundation's work. It seeks to mobilize systemic transformations by integrating policy, financial, social, and technological solutions. The Foundation tests pilot projects, spin them off, or join others to help implement successful demonstrations on a wider scale. It also aims to inform public policy through support for research, advocacy, and coalition building.

The Rockefeller Foundation's Developing Climate Change Resilience Initiative aims to catalyze attention, funding and action to promote resilience to climate change on several levels. It focuses on three pivotal areas: Asian urban environments, African agriculture and US policy. And they are promoting awareness and guiding funders and policymakers to support broader action on climate change resilience, nationally and internationally, to help poor and vulnerable people around the world.

In addition to grants, the Rockefeller Foundation has also been making program related investments (PRIs) since the early 1990s. The PRIs can be structured as loans, equity or a guarantee. Like grants, these PRIs are aligned with the Foundations' initiatives and overall strategy.

Shell Foundation	
Sector Focus	Energy
Geography Focus	Global

Shell Foundation was established by the Shell Group in 2000 as an independent charity operating with a global mandate. Shell Foundation's mission is to develop, scale-up and promote enterprise-based solutions to the challenges arising form the impact of energy and globalization on poverty and the environment. It acts like an investor, identifying financially sustainable solutions to these challenges that can be taken to scale and easily replicated to achieve global impact.

In order to guarantee sustainability and a global impact, the solutions must be financially self sufficient within a defined time period and easily copied on a large scale so that they can achieve global impact.

As part of the Foundation's focus on tackling both the lack of access to electricity experienced by almost two billion people and climate change it is supporting the growth of start-up businesses that provide electricity using bio-energy technologies such as biomass gasification and biogas. With India being the initial target geography, the first organization to receive support was Husk Power Systems (HPS), a bio-energy company. It secured seed capital from the Foundation to scale up operations of their unique and cost-effective biomass gasification technology, which converts rice husks into electricity. HPS owns and operates 35-100 kW "mini power-plants" that deliver electricity as a pay-for-use service to villages of 2,000 to 4,000 inhabitants in the Indian Rice Belt.

SNV	
Sector Focus	Agriculture, Energy, Water, Sanitation, Hygiene
Geography Focus	Global

SNV is a Dutch not-for-profit organization that started 40 years ago and works in the sectors of agriculture, energy, water, sanitation and hygiene in 36 countries, and has 1,300 employees in over 100 offices worldwide. SNV does not offer funding, but specializes in developing local capacities, strengthening governance systems, and making markets work for the poor through demand driven approaches.

SNV works to provide solutions to energy poverty by enabling access to renewable energy in those areas where it can have the greatest impact on livelihoods - reducing poverty and stimulating growth in rural and peri-urban communities. They have programs in the areas of domestic biogas, biofuels, cook stoves and improved watermills.

SNV has a very robust domestic biogas program. Since starting biogas activities in Nepal in 1989, SNV has supported local organizations across three continents and helped install 430,000 households with domestic biogas units. At the invitation of the Asian Development Bank, SNV is now leading a working group on domestic biogas in the framework of the 'Energy for All Partnership'. Through this initiative, an additional one million biogas plants are planned across the Asian region by 2015.

SNV's biogas activities have been expanded to include Africa. Rwanda was the first country of engagement, with another six countries (Senegal, Burkina Faso, Ethiopia, Tanzania, Uganda and Kenya) targeted in the framework of the 'Africa Biogas Partnership Programme'. This Program started at the end of 2008, aims to reach 70,000 households by 2013. In addition to biogas, SNV is also working with local counterparts on liquid biofuels.

Toniic

Sector Focus	All
Geography Focus	Global

Toniic is an international impact investor network with the aim to build the quality and volume of impact investing and increase the velocity of money to this field. Toniic brings together a peer-to-peer network of seasoned impact investors, creating a safe space for investors to share, learn together, co-invest and nurture enterprises and funds. Members and entrepreneurs share deals monthly connecting on the ground in San Francisco, Amsterdam and India and logging in via video conferencing. Toniic primarily serves as a convening body, creating the environment for its investors/co-creators to do the most impactful work possible. An earned income model based on membership fees and sponsor support ensures the long-term sustainability of Toniic.

Toniic's investors are interested in projects across a variety of sectors including poverty, healthcare, education, environment, housing, and more. They will consider enterprises and funds based anywhere in the world.

Toniic members actively engage with their peers to make the most of their collective time, resources and engagement and commit to making at least two investments per year. Member benefits include access to pre-vetted deals and due diligence. Their priority deal flow consists of enterprises and funds that at least one member has already invested in or strongly advocates for. Members can identify others through the network to collaborate on conducting due diligence (either themselves, or by sharing the cost of contracting others) and agree to share due diligence with the full network. Toniic staff helps coordinate this process. Toniic also connects its members to impact oriented investment service providers, such as legal service providers, impact intermediaries, and others.

Water & Sanitation for the Urban Poor (WSUP)

Sector Focus	Water, Sanitation, Hygience
Geography Focus	Africa , Bangladesh

WSUP works to support the adoption and replication of effective, sustainable and scalable models of pro-poor urban water and sanitation services by service providers and/or national governments. This is achieved by building long term partnerships with service providers to plan, design and deliver urban water and sanitation programs. In its 2011-2016 strategic plan, WSUP is committed to scaling up and expanding its programs in six target countries (Kenya, Madagascar, Ghana, Mozambique, Zambia and Bangladesh) by assisting local service providers to demonstrate scalable, market based models in low income districts and mobilizing $300M finance to take these to scale.

WSUP Enterprises is a newly launched subsidiary of WSUP which incubates new business models in low income urban WASH, provides technical assistance to SMEs and brokers finance to support their growth. In order to get to scale as quickly as possible, WSUP Enterprises will focus the bulk of its support to two or three successful businesses that emerge from this process and have the potential to expand across a number of countries.

The SME Financing Facility will seek to lend £5M by the end of three years. Set up as a social-impact-first debt instrument only with 0% interest, it will provide loans to selected SMEs once they have demonstrated the business model and reached an annual turnover of at least US$0.5m. WSUP is in discussion with a number of funders regarding investment into the facility.

They will also look at running a Fellows program like at Acumen, with the difference that WSUP Fellows will provide pre-investment incubation support. The incubation support is to help the businesses develop and pilot their ideas in a controlled project environment to demonstrating proof of concept. Sample business would be like the Clean Team project co-funded by Unilever in Ghana, which is a household mobile collection toilet products and collection services model. Revenue is from collection services, with the toilet design from Sweden for now, later manufacturing in Ghana with a target price of $40, so the payback for the toilet through service revenues can be less than a year. Unilevers interest is in this as a new distribution channel for their products.

Additional Funders

Hilton Foundation

The Conrad N. Hilton Foundation supports leading nonprofit organizations, and it partners with foundations, philanthropists, governments, and corporations to solve social problems in the United States and around the world.
Hilton Foundation cultivates long-term partnerships with key organizations that deliver measurable results in their priority areas that include water, homelessness, disaster relief, children and many more. Grant payments made in 2011 were over $80 million, with $13M for the water sector.

Calvert Foundation:

By creating innovative financial products and services, Calvert Foundation has made it possible for everyday people, not just institutions, to participate in financial instruments that directly serve communities. Currently, Calvert Foundation has nearly $200 million invested in 250 community organizations in the US and over 100 countries. The Calvert portfolio comprises investments in a diversified mix of sectors such as small business development, environment, affordable housing, microfinance and Fair Trade coffee.

Calvert Foundation raises capital by offering Community Investment Notes that start at $20 and are available in various terms and rates up to 2%. From funds generated by the Investment Notes, Calvert Foundation provides loans to social development projects for low-income communities.

UN Foundation

The United Nations Foundation links the UN's work with others around the world, mobilizing the energy and expertise of business and non-governmental organizations to help the UN tackle issues including climate change, global health, peace and security, women's empowerment, poverty eradication, energy access, and U.S.-UN relations.

Since 1999, in partnership with the UN Environment Programme and the nonprofit E+Co, UN Foundation has invested $4.3 million to help small-business owners use clean-burning sources of energy. The Africa Rural Energy Enterprise Development (AREED) approach offers rural energy entrepreneurs a combination of training, support to develop business plans and start-up financing. Helping these small businesses build a sound financial and business foundation attracts investors from more mainstream financial institutions. AREED companies offer a range of services and products, including energy-efficient cook stoves, solar dryers for food preservation, solar irrigation systems, wind-pump repair services, supply and service of solar home systems, liquefied petroleum gas services and environmentally friendly charcoal production.

Recommendations

Waste-to-energy enterprises is a nascent market, and funding the existing investors in renewable energy or capitalizing a dedicated portfolio with a fund manager is, especially in the case of fecal sludge to energy, not recommended due to a lack of sufficient deal flow. While there is interest from various new funds for co-investing in them, that would not be a sustainable way to build the space, as there are not enough W2E deals for a dedicated portfolio at this time. Individual projects could be co-invested in rather than funding an entire portfolio with them.

What is needed is the creation of a market itself i.e. a pipeline, that these and other impact investors can then fund at a later stage. To address the challenges to market creation and growth mentioned in the Overview section of this report, and mapping those against the strengths and weaknesses of the investors, below are some recommendations for the Foundation and other investors to consider.

These are not meant as exclusive of one another, but rather, given the need in the market, multiple of these could be initiated in parallel.

1. **Conduct a two-part study of commercial resource recovery businesses**

    A. This should start with an analysis of the commercially viable waste-to-energy businesses that exist in various parts of the (developed) world to understand their economic models and what makes them work. This study should map the businesses using a diversity of input streams, market sizes served and regulatory framework within which they operate. The output could be a "business-in-a-box" type template that could provide a set of existing viable, commercial solutions against a matrix of scenarios like:

        - Different input streams ie fecal sludge, animal waste, agricultural waste
        - Different commercial products that are created from the resource recovery of these products.
        - Technologies used across these models
        - Market size served and how that relates to the volume of input feedstock and challenges to scaling further
        - Profit margins vs. volume; and
        - Role of regulations

    The study would capture the real costs of capital expenses of the different sized bio-digestors (or other technology systems) used and of waste collection-including the costs to ensure stable supply on input. It should help address the question of what fundamentally drives the business model – whether that is the market demand, regulations or nature and quantity of feedstock.

B. Evaluation of the waste-to-energy pilot projects that are currently being tested in Africa and a comparative analysis of their business models. This should identify barriers for commercial viability and scale

2. **Fund pilot projects based on the successful business models from the two-part study, by replicating as greenfield projects, or incorporating relevant elements within existing enterprises in Africa**

   Following the study of the various models, criteria for economic success and overcoming barriers to scale can be identified for different waste streams/outputs. In partnership with the local governments, models best suited for African contexts can then be replicated as pilots. Picking the most viable models based on the feedstock, a determination could be made of the technology and market conditions needed for the best financial return, and the necessary regulatory support for the project secured. This could start by gathering major industry players in order to understand their fuel needs and to get pre-agreements for purchase. Compost businesses might involve working with research institutes to lower costs of production to make it more attractive as compared to cost of existing fertilizers.

   Alternatively, the learnings from the commercially viable businesses can be used to improve the business models of the current early stage enterprises in Africa.

3. **Co-investing in commercial projects in the pipeline of Fund Managers**

   A few opportunities present themselves to further large greenfield projects by that are being planned by private equity fund managers.

4. **Fund incubation support to help commercialize pilots projects**

   Funding for business strategy support is needed to assist entrepreneurs in getting from the feasibility stage to the pipeline stage that would make them attractive for impact investors and others.

   There are several enterprises in Africa that are in the proof of concept stage that could benefit from technical assistance especially for business and marketing support to help move these to the investment-ready stage.

5. **Fund Business Plan competitions**

   The advantage of this approach is the number of projects it can potentially create – especially in a market that is not organically growing. In the case of private equity investors or impact investors, there is a narrow choice of deals that they can make. An open business plan competition opens up the playing field and more risks can be taken in funding. This will help open up the market so others can crowd in.

6. Funding for biogas technology at institutional level

Implementing household level biogas units has been very successful worldwide as evidenced by SNV's programs. However the same scale of success has not been seen at institutional levels. Funding could be provided to local implementing partners to show proof of concept of the biogas technology at the institutional level, and then for commercialization.