Productive use kits

Developing modern energy PU options for the Zambian and Tanzanian markets

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1 Introduction

The productive use of energy in the creation of livelihoods represents an important conduit in the relationship between energy and development. By productive use, we are referring to the application of energy sources, particularly the renewable and energy efficient kind, in the pursuit of income generating opportunities[1]. The productive use focus represents a shift away from the infrastructure approach to development where modern energy services are made more accessible to an approach which facilitates the linkage between energy services and income generation. The key to promoting sustainable access to modern energy services lies in the ability to associate income generating opportunities with the provision of such services.

This Productive Use initiative was funded by USAid and is designed both to contribute to the process of implementing productive use concepts and ideas as well providing a number of packaged business models for application in developing countries. The lead assumption driving the project is that while renewable and efficient energy sources have a significant role to play in facilitating development in developing countries, these services need to be sustainable. With its focus on identifying and developing income generating opportunities, the productive use approach to service provision has sustainability at its core.

The objectives of this project are twofold;

- To develop a generic template for the planning of productive use projects that outlines the considerations and criteria supporting successful implementation. This template acts as a guide for potential PU initiatives, assessing the conceptualisation, planning, funding, dissemination and implementation aspects of effective PU interventions. These issues form a crucial part of developing *kits*, the packaging of PU initiatives, which is intended to facilitate the implementation of PU programmes.

- Develop a number of business models that can be implemented in selected countries.

The first objective addresses an important issue. The approach to PU inititaives promoted in this programme is one that embraces the 'Kit' approach. The intention here is not simply to identify and promote productive use opportunities but to develop complete business kits, including business models, needs analysis procedures, technical support, monitoring regimes, etc. The logic of the kit approach is to enable us to address some of the risks associated with starting up a business. The business package or kit enables the

[1] While energy applied to education, health services, etc. has a productive use, we for the purposes of this project, have limited productive use focus to income generating opportunities rather than a more embracing 'betterment' interpretation of PU.

implementing agent to maintain greater control and certain guarantees over the various aspects of SME development and management. Given that these kits are intended for developing countries, issues such as enterprise development, customer relations, business management, marketing, procurement, etc. are an integral part of the kit.

The countries selected for the purpose of this programme are Zambia and Tanzania. The selection was based on a number of factors including the knowledge that participants in the study have of these countries[2]. Both countries exhibit the normative *developing country* profiles including larger rural populations, an unsustainable reliance on traditional fuels, poor infrastructure, high unemployment and a need for the development of private sector capacities.

2 The productive Use Concept

2.1 Energy and productivity

The concept of generating a livelihood out of the commercial application of energy sources is neither new nor original. Perhaps the most powerful illustration of this was the industrial revolution where the capacity of industry was determined by the availability of energy and how innovation in energy utilisation improved industrial performance. Indeed, the link between energy and commercial and industrial productivity has been well established and needs no further elaboration here. What is of interest however, are the assumption that underlie this relationship. A common error, particularly in the light of this relationship, is to assume that such a relationship is causal; that the availability of energy resources or services necessarily leads to the establishment of productive activities.

Returning to the Industrial Revolution, while certain details and their relative influence on the process are disputed, it is generally accepted that no single development in the United Kingdom can adequately account for the Industrial Revolution. Instead, what most economic historians propose is that it was a number of factors, such as the Agrarian Revolution in Europe, the proletarianisation of the peasantry, a cultural disposition towards industry, the emergence of a capitalist framework, etc[3]. created an enabling environment for the industrial developments of the time.

It is on this *enabling environment* that productive use initiatives must focus. While working on the micro-level, productive use projects need to address the total environment in which these SME's must operate. There are a range of factors and considerations to be addressed if the provision of energy services is to contribute to income generating opportunities. Obviously access to energy service is necessary but access alone is

[2] Tanzania and Zambia form part of E+COs African investment activities.
[3] Crafts, N.F.R. (1984), "Economic Growth in France and Britain, 1830-1910: A Review of the Evidence," Journal of Economic History 54(1), 49-67

inadequate to ensure productive use is made of such services. In the body of the discussion that follows, we draw attention to the factors and conditions which need to be addressed to ensure the establishment of a conductive environment for the successful operation of PU businesses.

2.2 The emergence of the productive use approach

Access to modern energy services plays an important role in improving the lives of the beneficiary communities. Its capacity to signify development has ensured that it, along with other services such as access to water, health services and education, has become an important indicator in the United Nations Human Development Report. However, the emergence of a more productive use approach to energy service delivery is a more recent development. Prior to the 1980s, service delivery was typically regarded as public expenditure, expenditure that was justified against the shadow pricing-based formula which acknowledged the less tangible benefits of the service. More recently however, national expenditure is increasingly managed on a financially transparent basis with Utilities – many of which are privatised – having to ensure a more commercially viable operation.

It is arguably within this context that the emergence of a productive use approach to service delivery can be rationalised. By coupling energy service delivery with income generating opportunities, energy services become more sustainable. Early reference to the concept of productive use of energy appeared in the 1980s, where for instance, a conference on Productive Use was held in Bangladesh[4]. A similar conference was held in Guatemala under the Central American Rural Electrification Support Programme where productive uses were promoted through seminars and specific interventions in the field[5]. The United Nations Industrial Development Organisation (UNIDO) has for some time now 'promoted the productive (income generating) uses of energy for rural development' regarding the concept as an important strategy for addressing rural poverty and development[6]. Another point on the productive use map was the Global Environment Facility and the Food and Agricultural Organisation of the UN which held an expert workshop on productive Uses of renewable energy in Rome in 2002[7]. All these developments suggest that the concept of productive use is increasingly being recognised as an emerging sector in both the development and energy service delivery field.

[4] Kittelson, D. 1998 'Productive Uses of Electricity' Paper prepared for Village Power'98, World Bank Headquarters, Washington, D.C. [NRECA International, Ltd]
[5] Ibid
[6] UNIDO Initiative on Rural Energy for Productive Use, June 2002.
[7] GEF-FAO Workshop on Productive Uses of Renewable Energy: Experience, Strategies, and Project Development Summary Report. FAO Headquarters. Rome, Italy. 18-20 June 2002

2.3 Illustrating Productive Use Businesses

Productive use ventures create small businesses which fill a local need and generate sustainable income for households. For the businesses to be viable at the village level they generally need to be low volume, low capital endeavours. The following examples illustrate some of the potential businesses improved energy services can make possible. Some are improvements to existing businesses while others fill a need not previously met in the village. The selection of which model to use (not necessarily one of these) will be based on the on-site needs analysis. The Table below further illustrates the range of sectors in which PU can play an important role. With opportunities in the Agricultural, Food processing/service sector, manufacturing and repairs, amongst others, the table illustrates the versatility and general applicability of productive use initiatives. Additionally, the table illustrates the range of energy sources that can support PU projects. While some sources included here are not renewable – which is the focus of this particular discussion – they do nevertheless point the way for the promotion of PU activities in electrified areas as well.

Agriculture			
productive use	**energy input**	**required machines or supplies**	**benefit**
Crop drying	solar thermal	direct or indirect dryer	improves quality and extends life of crops
Greenhouse	solar thermal	wood, glass, fasteners	Creates opportunity to grow high margin goods (like flowers), increases stability and output of garden, improves quality of vegetables
Irrigations/Water Pumping	solar thermal, wind, or PV	Pump, plastic/rubber tubing	expand range and output of small farm
Storage	electricity	refrigerator/freezer	less spoilage of product, can save some produce to sell when availability is low and prices are high
Packaging and Canning	electricity	pressure canner, cans, lids	Heating and sealing foods lengthens shelf life, transportability, and expands potential market for goods
Food Service			
productive use	**energy input**	**required machines or supplies**	**benefit**
Restaurant or Food Stand	electricity	-refrigerator/freezer -oven, hotplate, fryer	-sell perishable products i.e. ice cream, juice, eggs, cream -make and sell meals or snacks
Water Purification	solar thermal or electricity	Still, pasteurizer	purified water could be sold in areas where fuel costs for boiling water are high
Manufacturing and Repair			
productive use	**energy input**	**required machines or supplies**	**benefit**
Tailor	electricity	sewing machine	make clothes or bedding, repair used items
Carpenter	electricity	electric drill, saw, sander	improve quality and output of products

Electronics repair	electricity	-soldering iron -battery charger	-fix small appliances -sell service of charging batteries for radio, clock, mobile phone
Communication			
productive use	**energy input**	**required machines or supplies**	**benefit**
Telephone	electricity	cellular phone	charge for outgoing and incoming calls
Business Center	electricity	computer, scanner, copier, fax machine	charge by the hour or per use for use of machines
Direct from Energy Supplier			
productive use	**energy input**	**required machines or supplies**	**benefit**
Make/sell energy products	none	wood, plastic, fasteners	energy supplier will bring awareness of new technologies, creates market for solar dryers, stills, and water heaters
Sell appliances	none	supplier	electricity brings demand for electrical devices and need for a retailer
Transport fuel	none	access to vehicle	if electricity supplied by a generator fuel will need to be brought in on a regular schedule
Repair turbines, panels, generators	none	tools	new energy technologies will create need for someone to do servicing and repairs

3 Enabling and inhibiting factors

There are a number of reasons why productive use initiatives succeed or fail. These reasons can be analysed on two levels; institutional and local. The local conditions such as access to funds, entrepreneurial support, market conditions, etc. are all crucial in defining the prospects of success for small productive use-based initiatives. However, it is at the institutional level that the capacity to promote the productive use approach is most crucial. The following discussion examines these issues, attempting to summarise the factors and conditions that promote both the success and failure of initiatives within the productive use field.

3.1 Institutional Level

A serious concern within the productive use sector is the lack of institutional support that such activities attract. Current productive use initiatives appear to be random and quite fortuitous rather than the result of an explicit strategy. As Ron White observed, 'Neither the GEF nor any other UN organization has in place a comprehensive plan to promote and encourage the development of productive use projects[8]. One possible explanation for

[8]White, R (2002) Background Paper Renewable Energy Application to Productive Uses, the paper was prepared as a contribution to the "GEF/FAO Workshop on Renewable Energy Application to Productive Uses," held from 18-20 June 2002 in Rome

this is that the concept of energy poverty has been increasingly dealt with as a separate field of poverty. This approach is not helpful in that it obscures the broader contours of poverty within which such people exist. People who lack access to energy services are marginal in most respects, including reference to employment opportunities, welfare support, health services, etc. It therefore makes more sense to ensure the design of energy service programmes is able to address a range of different development requirements. As we discuss below, this is generally not the case.

In most cases, the focus is placed exclusively on improving access to services. Energy service projects are infrastructural developments. While such efforts do contribute to broader poverty alleviation objectives, they underachieve in this respect. Where income-generating opportunities are explored in tandem with energy service initiatives, the potential contribution to general development objectives is greatly enhanced. In addition, at a time when public spending is more constrained and the management framework of public utilities is more corporate and commercial, the ability to intertwine public services with income generating opportunities will greatly improve the financial sustainability of these programmes.

To be sure, there are many productive use initiatives that have been undertaken despite these institutional limitations. However, our ability to communicate about and learn from these experiences is greatly reduced by the absence of a supportive framework. If the productive use of energy was to be formally recognised by institutions such as the GEF and other UN departments, as a value-adding component of energy service delivery, this would raise the profile of PU and promote communication between current and future agents within this field. In addition, commercial institutions would more readily contribute to such programmes.

Most important, such a framework will encourage the expansion of productive use activities, improving the value adding potential of energy service delivery programmes. The potential for productive use initiatives to contribute to broader development objectives depends on the recognition and support they receive at the institutional level. It seems somewhat ironic that such a framework does not already exist for the thinking appears to be in place. For many years now, arguably since the Second World War, *development* has been approached in increasingly broad terms. A powerful lesson, and one learnt largely through failure, has been that successful development needs to be very sensitive to the conditions within which it takes place. Within this caveat is the suggestion that such projects need to relate to the broader socio-economic and political conditions of the country or community beneficiaries.

Energy service initiatives, while often motivated by issues of poverty are, essentially infrastructural initiatives which lack sufficient social and economic sensitivities. South Africa, at a national level, is a case in point. After the first democratic elections, the government established the ministry for reconstruction and development (RDP). This would be a single ministry that would oversee the reconstruction or improvements in the conditions of the country's poor. Some years later this ministry was closed and the mandate was transferred to the 'relevant' existing ministries; such as housing, public

works, infrastructure, environment, etc. While the move was accompanied by compelling arguments surrounding efficiency and duplication, at the same time, a certain framework or approach to development was lost. When the RDP was operational, development projects focused on broader needs, addressing the housing backlog at the same times as water, energy and other services was supplied. This approach included basic income generating opportunities although insufficient attention was applied at the time.

The South African scenario is not dissimilar to international development agencies where development streams are identified; energy poverty, the environment, education, etc. and the overlap between them is not explicitly encouraged. Just as South African government departments don't share budgets, international development streams appear to make it difficult to share ideas. The approach to development has become fragmented arguably for purposes of effective management that it has begun to manage the way we think about development. The marginal position of productive use activities is symptomatic of this process and, similarly requires institutional or 'macro-level' encouragement to ensure that these opportunities are optimised.

3.2 Local level issues

While certainly related to the institutional support of PU activities, here we are looking more specifically at the optimal conditions under which PU projects should operate. There is no formula for success, rather the right set of conditions and inputs will improve but not guarantee the chances of success. Success or failure is dependent upon many factors that will vary with the environment of the development. Instead we can list areas that typically impact on the success of PU or SMME businesses.[9]

3.2.1 Training/Preparation

Some of the people interested in small businesses will have knowledge of business practices but others will not. It is important that a person have some degree of training in budgeting, accounting, marketing and customer services. To illustrate, *Jua Kali* workers in Kenya often reduce their prices to below what it cost them to make an item because they have not calculated their per unit expenses. Similar accounts from small businesses in South Africa suggest that entrepreneurs often underestimate the true costs of goods[10]. Training or Enterprise development assistance (EDA) is crucial for improving the chances of success in productive use endeavours.

Commercial sustainability will only be realised if entrepreneurs are trained, over time, in the requirements of successful business management. This implies that the creation of PU opportunities should be regarded as a process – much like site-and-service housing -

[9] Based on "Small Enterprise Development in Africa: Lessons from Success" by John Wallace, Marshall University http://www.sbaer.uca.edu/Research/1999/SBIDA/99sbi210.htm

[10] Jones, Aitken and Luckin, 1996, Energy, Poverty and Prosperity, Report commissioned by the DME, South Africa

which requires ongoing inputs before it achieves its objectives. While training requirements will vary according to experience and capacity levels as well as the nature of the business, what is constant is the importance of this aspect of the process. In more recent times, the training has acquired a distinctly 'business-like manner' with a demand-led market orientated approach. A second important feature of this shift is the monitoring and evaluation programmes that are appended to these programmes. Shifting the focus from energy services to specific commercial applications and outputs requires significant planning and training. We are no longer looking at infrastructure and passive development benefits, a successful PU initiative requires active involvement and training, the costs of ensuring longer-term financial sustainability. While greater resources are required to support these monitoring and evaluation programmes, the benefits accruing from this approach far outweigh the costs.

Huge amounts each year are invested in energy related projects, including those with significant PU potential. In order to ensure success, to validate and protect these investments, as well as ensuring replicability, monitoring and evaluating regimes are crucial. One of the institutional constraints mentioned above was the inability - due to inadequate forums and support - to learn from other PU initiatives. The promotion of monitoring and evaluation programmes will, given the creation of a supportive institutional framework, encourage the dissemination and sharing of results. A key development in the promotion of PU activities.

3.2.2 Consulting & professional services

Small-scale entrepreneurs need advice from an experienced source which is relevant and inexpensive. Local consultants are ideal because they will be aware of the market and consumers' needs. Outside consultants can be successful if they are aware of the local environment but there is still the danger of applying a "one size fits all" model to the business. Unfortunately local specialist consultants may be hard to find. Another approach in this regard is to assume the role of facilitator, bringing local people together. Every country, developed or otherwise, has a resource base in terms of skills and human development. The problem in developing countries - as opposed to developed - is managing these resources effectively. In the case of productive use initiatives, where local specialists are in short supply, one option is to identify allied professionals; business people, university graduates, etc. and incorporating them into the PU initiative.

The benefits of this approach are numerous, including the injection of local knowledge of markets and consumers, the promotion of local ownership of the initiative and assisting the market to more clearly articulate its needs. Consulting acknowledges the 'process' approach to ensuring PU success while at the same time respecting the complexities of local conditions.

3.2.3 Technology Development and Transfer

Taking a leaf out the book of the 'appropriate technology movement' of the 1970s, PU activities must consider technologies that are appropriate to the development context. High technology will not find an easy home within the developing world, particularly in rural areas. A shortcoming or challenged faced by the PU sector is that the implementing

agents often have access to or knowledge of a range of technologies that are, at times, not suited to the context of application. Efficiency and innovation are relative terms which can be the undoing of PU projects. For instance, while renewable energies have great application potential in the context of PU endeavours, the choice of such technologies should reflect the capacities, both technically and in terms of design, of the benefiting communities. That said, opportunities for technology transfer should not be overlooked.

This caution applies both to technologies produced through PU activities as well as those utilised within PU programmes. A balance should be achieved between the technology transfer potential and the introduction of appropriate technologies. There will be opportunities for the introduction of new technologies but these decisions must be informed by the capacity of the benefiting communities to integrate these requirements. While the promotion of PU activities is contingent upon the recognition of broader development factors, such as the income generating opportunities that energy service extensions provide, so to should technology choices be informed by a broader capacity to appropriate these technologies. If this balance is not achieved, local investment - social and economic - will not be forthcoming.

3.2.4 Support Activities

While sections above addressed the need for continued contact after the setting up or implementation of PU activities, support activities refer directly to information supply for and between PU participants. As part of the longer-term support required for successful PU projects, communication, small business associations, information 'shops' and possibly micro trade fairs should be part of the supportive infrastructure. While the organisation and possible funding required are aspects implementers might wish to avoid, these activities and bodies provide crucial information dynamics that will, in the right conditions, contribute towards the success of PU initiatives.

There are a number of issues to consider in developing such supportive strategies[11]. The media or processes involved need to consider who their audience is. Attention needs to be paid to how information is presented - as printed materials, in many cases, may not be the best approach. Where advice/guidance is offered, select people that owners/managers can respect. Consider charging for material, as owner/managers must be prepared to pay for information that offers improvements in income and, finally, actively promote the information to reduce scepticism about its usefulness.

3.2.5 Enterprise and commercialism

This is arguably the most crucial aspect to ensuring the success of PU projects. With all the other factors and conditions in place, the project will succeed or fail on the ability of the entrepreneur to penetrate the market and to sustain and, indeed, grow his or her market share. The kinds of intervention necessitated by ensuring market penetration themselves carry certain cautions. If, for instance, it is necessary to facilitate market

[11] John Wallace, Small Enterprise Development In Africa: Lessons From Success Marshall University

reach, through the aegis of a broker, then certain rules and conditions, protecting the entrepreneur, need to be put in place. Given the limited income of most PU enterprises, revenue cannot be spread too thin. It may be necessary to include brokers for an initial period and then to slowly reduce the dependence of the entrepreneur on the broker.

Indeed, the mentoring of businesses, either in the form of declining equity or a franchise structure, must avoid the situation where external agents control the business for too long. While interventions are important, this needs to be balanced with the ability of the entrepreneur to, at some point, 'go it alone'.

3.2.6 Gatekeeper; the politics of development

The discussion on energy transfer touches on the notion that the entrepreneur and the local community must assume ownership of the PU initiative. This does not refer to the legal concept but rather the social and political acceptance of the initiatives. Whatever the conditions and whatever the potential to alleviate such conditions, initiatives will, in many instances, only be accepted in there is approval by the broader community. While poverty, on certain levels, is amorphous, without structure and order, there is much social and political capital to be gained from ushering development. In implementing PU initiatives, the contours of local politics need to be followed closely.

4 The Productive Use Kit

Experience in the provision of Enterprise Development Assistance and early stage finance to energy enterprises has shown a lack of knowledge and skill by entrepreneurs to undertake comprehensive fact finding in early stage business plan development. Extensive human and financial resources is then spent training entrepreneurs on how to undertake such fact finding only to result in unviable or badly prepared plans.

The aim is to eliminate this by formulating kits which match needs, technology, viability, marketing, operations and distributions plans into income generating ventures using modern energy sources. The PU Kit would not be dissimilar to that which is provided by the franchisor to franchisee. The entrepreneur will have the advantage of foregoing the critical fact finding stage thereby enabling more time and resources being spent on acquiring specific managerial knowledge and careful business plan implementation. The entrepreneur would also have the support of pre implementation assistance in the form of Enterprise Development Assistance[12], easier access to suitable soft funding as well as post implementation assistance.

The starting point for such a kit would be a through analysis of the needs specific to a community. These needs would then be assessed in terms of the social, political, environmental and economic context of the area. Once the setting for the venture is in

[12] See Section 10 as to what this entails.

place the actual business model can be built up on the basis of the aforementioned factors. Once viability has been established the kit needs to be complemented by a capable but more importantly willing entrepreneur who will be provided with ongoing pre and post implementation support. This may include technical manuals, drawing up case specific marketing, distribution and operational plans and sourcing suppliers for both capital goods and monthly inventory.

5 Country information

This section of the report provides background country information on Zambia and Tanzania. It looks at broadly at the socio-economic and political landscape, identifying opportune areas for developing productive use interventions. The successful PU initiative is effectively a two-way process of identifying niche areas for intervention while at the same time assessing the technological and financial feasibility of a range of PU opportunities.

5.1 Country overview

	Zambia	**Tanzania**
Country Size:	752,614,59 sq km	945,081,59 sq km
Population :	9,959,037 (2002)	37,187,939 (2002)
GDP growth:	3%	6%
GDP per Capita (in US$):	$401	$271
Local Currency:	Kwacha	Shilling
Exchange Rate / $US:	4920 (April 2003)	1026 (April 2003)
Inflation (Annual):	22,9%	4,4%
Banks' Lending Rate	54%	16,5%
Electricity Production:	5,8 billion kWh (2000)	1,7 billion kWh (2000)
Primary Source:	99% Hydro	71% Hydro 29% Fossil fuel

While Zambia is typical in a number of respects of a developing country, perhaps what offsets it from many other such countries is the intensity of these defining characteristics. The population of Zambia is 10.2 million. Approximately 86% of Zambia's population live below the poverty line while in excess of 50% of adults are unemployed. Of a labour force of some 3.4 million, 85% are employed in the agricultural sector, 6% in industry and 9% in the service sector. While agriculture absorbs 85% of the country's labour

force, it only contributes 17% to the country's GNP. It is the service sector, employing 9% of the labour force that contributes disproportionately, at 58%, to the GNP. These skewed contribution point to a deeper malaise within the Zambian economy. While the economy's primary sector is the largest employer, its relative contribution to the country's GNP has been steadily declining over the past decade or so.

While Tanzania's past provides a contrasting historical portrait to that of Zambia, their current positions, and indeed, their futures are closely intertwined. With a strong Arabic influence along the coast and Island states, Tanzania's early contact with the Arabic settlers and traders remains pronounced. In turn, Tanzania's post-colonial history again separates the two countries. The 1967 Arusha declaration and subsequent Nyerere policy announcements ushered in a period of high socialism which lead to the villagisation policy and a number of five year plans moulded on the Soviet and Chinese development models. However, despite these contrasting histories, the current situation in Tanzania is very similar to that of Zambia. Tanzania is one of the poorest countries in the world. The economy is heavily dependent on agriculture, which accounts for half of GDP, provides 85% of exports, and employs 80% of the work force. Perhaps the most significant similarity, for the purpose of this discussion, is the IMF's restructuring process that is redefining the economies of these two countries.

5.2 Commodities, structural adjustments and new opportunities

While post-colonial Zambia experienced rapid economic growth in the late 1960s and early 1970s, the fragile basis of such growth was exposed by the rapidly declining commodity prices experienced in the 1970s. Zambia's economy had been based squarely on the rich copper deposits in what was appropriately named the 'Copper Belt'. The centralisation of mineral incomes and it must be said, investments, was largely at the expense of other regions and economic sectors. Typically, mining investments are capital intensive with very few forward or backward linkages, resulting in little collateral development opportunities. The fall in world prices for copper and a decline in the quality of its ore exposed the country's over-dependence on copper. Instead of adjusting to these new economic realities, the Zambian government borrowed money to maintain the copper mines, a precarious source of national pride and the single largest employer in the country. This was followed by the introduction of price controls and subsidies which cost up to 20% of the budget at it peak. An additional expense was that since most major industries were privatised, the losses experienced through unrealistic price controls had to be funded out of the budget.

Nyerere's Tanzania of the late 1960s and 1970s was one of engineered socialism. Few of these reforms reflected the nation's institutional strengths and its actual economic potential. While agriculture was the traditional way of life, the early 5-year plan looked to manufacturing and market sectors as a way to increase national income[13]. 'Indigenous co-

[13] The World Economic Factbook 1996/97

operatives' and heavy government participation - occasionally with the nascent private sector - were considered an effective approach to addressing inequalities within the country[14]. What this policy served to do was exacerbate the inequalities between rural and urban opportunities, with small holder farmers being the most severely affected. The bureaucratic institutions required to support these reforms resulted in a disproportionate increase in services and public administration. The failure to develop agriculture went hand in hand with the failure of the policy of self-reliance

By the mid 1980s, the government was faced with a severe economic crisis caused mainly by its policies and exacerbated by other factors beyond its control. Factors included, the first and second oil shocks; the financial burden of a war with Uganda, the decline of commodity prices and the global economic recession. The dislocation of agricultural workers led to inefficiencies in production. The country's per capita agricultural output fell behind its population growth. Other problems, including pest infestation, lack of foreign investment in agriculture, and inadequate rainfall forced Tanzania to import large quantities of cereals in 1983-85 to feed its people. Lack of suitable storage facilities resulted in the destruction of up to 40% of harvested crops. Unfavourable weather, flood, and pests also contributed to the deterioration of the agricultural sector. In 1991, the IMF launched an Enhanced Structural Adjustment Facility (ESAF).

In both countries these reforms worked towards a similar set of objectives, including:

- Market-determined exchange rate
- Liberalisation of exchange controls
- Removal of price controls
- Removal of import licensing requirements
- Reduction in tariffs to the current 3 non-zero rates of 25% (finished goods),
- 15% (intermediate goods); 5% (capital goods) and zero on selected raw materials.

In short, the reforms were aimed at integrating the two countries into the global economy and diversifying their economies. For Zambia this diversification was away from dependence on copper and to increase non-traditional exports (NTE). NTEs more than doubled between 1991 and 1997, growing at an average of 20% p.a. Rapid growth has been particularly evident in the agricultural sector. These included cut flowers and horticultural products (primarily to the EU market), processed foods (primarily to regional markets) and primary products including cotton, tobacco and sugar[15]. It is predicted that agriculture and value-addition to agricultural products will be particularly important. Export growth of this magnitude would have substantial effects on employment and income, especially for small-scale farmers and agricultural workers.

[14] Kaplan, Irving, ed. 1978. *Tanzania, A Country Study*, Foreign Area Studies, American University: Washington D.C.

[15] Atkinson, K 2002. Fostering Rural Economic Development through Agriculture-based Enterprises and Services. International Workshop. 20.- 22. 11. 2002, GTZ-Haus, Berlin. Case Study:Small Scale Food Processing in Zambia – The Cinderella Industry. P2

This would have a substantial impact in poverty reduction. Based on these estimates, the above study predicts a reduction in the proportion of the population living below the poverty datum line to under 50% by 2010[16].

In Tanzania, heavy inflows of international donor aid have been paralleled by massive reductions in government expenditures (50,000 jobs have been lost since 1992). The Tanzanian Shilling (Tsh) loss also been further developed. Growth in 1991-2000 featured an improvement in industrial production and an increase in output of minerals, led by gold. Recent banking reforms have helped increase private sector growth and investment. Continued donor support and solid macroeconomic policies should allow Tanzania to achieve real GDP growth of 6% in 2001 and in 2002.

5.3 Productive use opportunities

In the context of the reforms discussed above, there are a range of opportunities for development in general and PU interventions in particular. Most of these opportunities are to be found in the agriculture and service sectors. Zambia has tremendous agricultural potential. Less than 20% of Zambia's arable land is cultivated. Zambia is much less affected by drought than South Africa, Botswana, Namibia and Zimbabwe. In Tanzania, only 4% of the country is under plough. Developments within the agricultural sector will, in turn, promote opportunities within the allied service sector. In addition, developments in the agricultural sector and, to a lesser extent, the service sector can draw on the resources of human capital and experience which will contribute to the sustainability of PU initiatives.

While monolithic investments in Zambia's agricultural sector may appear to mirror the mistakes made in the mining sector (or Tanzania's focus of Manufacturing and Marketing) there are a number of factors which reduce the risks in this regard. Like copper, agricultural export earning are linked to global markets, implying similar levels of uncertainty. However, unlike copper, these products are not valued according to changing industrial requirements but rather in a context of global food shortages. Additionally, there are a range of value adding processes that can be undertaken in country that improves the value and subsequent market access of agricultural products. A second tier of uncertainty that needs to be addressed is the impact of droughts and the cyclical nature of agricultural productivity. While agriculture will always be somewhat susceptible to droughts and other climatic variations there are a number of holistic interventions that can be undertaken to ensure the longer-term sustainability of the sector. Measures which in themselves present a range of productive use opportunities. In terms of opportunity, one needs to look beyond agricultural production per se, and investigate the holistic supportive framework that will underpin the sustainability of this sector.

[16] Atkinson, K 2002. Fostering Rural Economic Development through Agriculture-based Enterprises and Services. International Workshop. 20.- 22. 11. 2002, GTZ-Haus, Berlin. Case Study:Small Scale Food Processing in Zambia – The Cinderella Industry. P3

Improvements in agricultural production require various levels of intervention. To start, increased production requires improvements in planning, knowledge, training financing, energy, inputs and markets. Looking more closely at these inter-related steps, we can identify a range of productive use opportunities. Importantly, investment in the agricultural sector creates allied opportunities within the agricultural and non-agricultural service sectors. The table below illustrates these opportunities.

Table One: Agricultural and primary sector requirements and PU opportunities

Description	Specific needs	Business opportunity/ Business model	Tech to be applied	Probable size $
Planning & education	1. Technical training & improved methods, 2. extension services, 3. small business management (book keeping, inventory management, etc)	PUC to bring technical/ knowledge services to communities Welding, mechanical courses, etc.	1. PV 2. Gas driven genset	20k-30k
Growing of crops, market gardening, horticulture, farming of animals and combinations (mixed farming).	1. Irrigation. 2. Fertigation. 3.Greenhouse growing. 4. Sanitation. 5. seed propagation 6. Dairy farming	1. Greenhouse. 2. Water pumping/sales 3. Irrigation equip manufacturing 4. Biogas digester - fertiliser & gas 5. Water sterilisation 6. Seed propagation business 7. Automatic dairy with refrigeration	PV Gas driven genset Co-gen for heat	5k – 20k
Manufacture of gas; distribution of gaseous fuels through mains.	Production of biogas for cooking and lighting Fertiliser production	1. Biogas digester: sale of fertiliser & biogas	1. Anaerobic digestion	15k-30k
Food preservation and storage	1. Silo's and other storage facilities 2. Food drying 3. Refrigeration	1. Food storage hardware manufacture 2. Solar dryers 3. Refrigeration business	1. PV 2. PV 3. Biogas/ diesel	5k-10k
Production, processing of meat, fish, fruit, vegetables, oils and fats. Manufacture of grain mill products, starches and animal feeds.	1. Oil extraction 2. Grinding/separating 3. Packaging	1. Mobile / stationary platform driven by Jetropha oil for various applications 2. PUC for off-farm processing 3. Solar bakery 4. Canning operation 5. Drying/Smoking meat & fish	. Solar, PV or combination. 2. RE fuel. 3. Solar. 4. Biomas	15k-40k
Collection, purification and distribution of water.	1. Underground water to surface. 2. Purification. 3. Collection and storage of water. 4. Distribution of water by unit (ex bucket). 5. Distribution of water in bulk (ex reservoir or pipeline). 6. Renting/selling water vehicles.	1. Water pumping, purification and retail to households. 2. Salt manufacture	1. PV 2. Solar	10k – 30k
Markets	1. Identify markets 2. Transporting goods to markets	1. Agriculture marketing agent 2. Transport business	Biodiesel	10k-15k

Farm maintenance & operation	1. Fencing 2. Communication	1. Electric fencing 2. Fixed cellular	1. PV 2. PV	10k - 30k 30k-60k

Other primary sector and local service opportunities

Description	**Specific needs**	**Business opportunity/ Business model**	**Tech to be applied**	**Probable size $**
Ocean and coastal fishing.	1. Small refrigeration. 2. Processing and production. 3. Lighting. 4. Aeration	1. Drying/smoking of fish 2.Freezing/transporting fish 3. Fish farming accessories	1. Solar 2. Biomas	5k – 10k
Wildlife management	1. Fencing 2. Vaccines	1. Electric fencing business 2. Vaccine refrigerator supply & servicing	PV	
Forestry	1. De-barking 2. Waste disposal	1. De-barking processes 2. Selling wood-chips/off cuts for briquetting	PV	10k-20k
Local services: Repair of personal and household goods. Telecommunications. Other community, social and personal services.	1. Shoe and clothes repairs. 2. Radio/TV repairs. 3. Barber . 4. Bulk to small packaging. 5. Battery charging. 6. Business services. 7. News agency & postal service. 8. Public phone agency.	1. Container with combination services.	1. PV 2. Gas driven generator	10k- 70k

The opportunities outlined above accord closely with the objectives and nature of public reforms undertaken in both the Zambian and Tanzanian agricultural sectors. The reforms are outlined below.

- Liberalisation of agricultural markets;
- Diversification of crop production;
- Development of the livestock sector;
- Emphasising services to small holders;
- Expanding economic opportunities for outlying areas;
- Improving the economic status of women;
- Improving the use of the available water resources;
- Full utilisation of land suitable for agriculture;
- Helping farmers deal with natural disasters; and
- Emphasising sustainable agriculture.

While these measures have been undertaken with varying levels of success, there are numerous impediments that need to be addressed. In the section that follows we draw attention to some of these issues and where possible, the

6 Constraints to effective PU interventions

We raised the issue of constraints in the general discussions on productive use initiatives. The constraints discussed hear refer specifically to the countries of Zambia and Tanzania. While there are certainly overlaps in the general and country specific analysis, there are at the same time a number of country-specific issues that require our attention. Again the analysis is separated into institutional and local level constraints.

6.1 Institutional

While the Zambian government and the IMF have committed themselves to a range of programmes aimed at reforming the Zambian economy and, specifically the agricultural sector, these measures are still actively being implemented. Obviously reforms of this magnitude are processional, with changes slowly filtering through the various levels of the economy and society. In addition, there has been some reluctance or inability on behalf of the Zambian government to carry out or fully implement the reforms. Consequently, there remain a number of institutional obstacles to the effective and successful implementation of productive use initiatives.

- *Lack of capital and access to credit*;

Whichever way one looks at it, the facilitation of rural finance seems to be at the core of any meaningful strategy of empowering smallholders and agro-processors to steadily enter an increasingly liberalised and commercialised agricultural sector. While there are existing programmes, such as the Rural Finance Sub-programme, The Rural Group Business Development Project, credit Management Services (CMS) which do extend credit to micro-businesses, they are not organised in a coherent way so as to ease access to these important resources. Survey's of small-business performance report that access to financial resources is an acute problem resulting in severe under-performance.

- Lack of diversified markets and market information

One of the constraints of being a pioneering business in Zambia's current economic environment is the lack of technology and relevant technological information. Successful small businesses require access to a range of services and information sources. Technology is a parallel requirement that has not received sufficient attention from the Zambian government. If commercial agriculture is to succeed, access to appropriate technologies is required in the process of lifting these activities beyond subsistence levels. Importantly, the extension of these technologies requires appropriate service infrastructure to enable their use in a more long-term, sustainable manner. This is particularly true of productive use activities which are dependent on various energy technologies.

- *Unfavourable policy environment and an inadequate institutional framework*.

As suggested above, in creating an environment where small businesses are able to succeed, a framework that acknowledges these various needs must be put in place. In Zambia at present, the intentions are there but in many cases the policy has not been translated into tangible activities on the ground.

6.2 Local level capacities

♦ *Skills*

The majority of businesses surveyed reported a lack of appropriate skills is a significant constraint to their effective operations. This was more marked in areas such as production techniques, management and sales/marketing. This issue is partially addressed in the KIT approach which is encouraged by E+CO/RAPS. In acknowledging these needs, development efforts that are essentially infrastructural in approach should be accompanied by some form of Enterprise Development Assistance (EDA). An important assumption, which should inform productive use initiatives, is that there are opportunities within rural communities but that local people do not have the human capital and wherewithal to exploit these opportunities. By importing technology and providing funds we are simply addressing the raw materials of opportunity, the know-how or skills to utilise these opportunities must come in the form of EDA or other knowledge streams.

♦ *Marketing*

This is the next step - or constraint - that new businesses must overcome. Given the 'new producer' status of productive use beneficiaries, there is little in the way of precedents or local knowledge for people to work with. To understand markets, particular beyond the local level, and to access these markets, resources must be made available to new entrepreneurs. Issues such as market information; price information; production information, and general business information must be available to PU beneficiaries. While this forms part of an EDA strategy it is sufficiently important to warrant specific attention. In most cases, PU interventions necessitate a change of status from consumer to producer. To effectively make this transition, PU beneficiaries need to access markets. While the agricultural policy regarding small businesses directly promotes this transition, the environment at the local level is not yet geared towards assisting to this end. While there are a number of institutions, in many cases linked to credit institutions, that provide such information, marketing has not, at least explicitly, been recognised as in independent variable. Marketing strategies must form in integral part of any effective EDA process.

♦ *Inadequate business premises, locations and infrastructure*

PU initiatives are often original interventions, which introduce a range and/or level of services that the target community is either not accustomed to or not prepared for. In this regard it is important to ensure that such interventions, where required, have the necessary premises to secure and/or facilitate business operations. It is not merely a matter of the physical premises but the location of such premises that requires some attention. This issue is obviously linked to market opportunities, as broached above. However, looking beyond the market, optimal location must consider the sustainability requirement of a specific PU initiatives.

Different kinds of PU initiatives will have different situational and location requirements in this regard. While these will differ, there are some broad principles that are applicable to all PU initiatives. First, one must consider the inputs required for operating the system, be that bio-diesel, the sun, animal waste, etc. In each case, there is an optimal location for the business vis-à-vis these resources. On the output side, the entrepreneur needs to consider the location of his/her markets, particular beyond the local market. Where are these markets and how conveniently is the business situated according to these markets? A further consideration is the service infrastructure which will contribute to the sustainability of the initiative. Collectively, these considerations form the business's spatial environment: its location in relation to the operational requirements.

6.3 Productive use and gender

Funding proposals might be influenced by the impact/benefits for women. Gender is an important issue in the conceptualisation and implementation of any development related project. This is no exception in the case of productive use initiatives. Zambia and Tanzania are examples of under-developed patriarchal societies where the position of women is undermined both by the lack of economic opportunities as well as the marginal position in society.

However, while development initiatives that purposefully promote women against a backdrop of culturally mediated marginality, frequently generate opposition from interest groups within such societies, energy-based gender initiatives can use these institutional constraints to their advantage. All societies integrate some division of labour in their social and material reproduction. In less developed societies, these divisions tend to be developed around social differences, such as gender and age, as opposed to more qualitative distinctions such as education and experience. In most patriarchal, less-developed societies, responsibilities for procuring and applying energy resources fall on the shoulders of women and children.

While this burden exposes women and children to a range of health impacts and lost opportunities, it can, at the same time, be utilised as a socially legitimate channel for their upliftment. By marketing productive use opportunities along these gender lines, PU initiatives can reach their primary beneficiaries without having to directly challenge the social order. While certainly not condoning the marginal position of women, this does present an opportunity to extend the benefits of development to women and in doing so, empowering them to challenge and control these societal or cultural constraints.

7 Business Models

The complete business models are contained in Appendix B. What follows is a brief description of each of the business models.

7.1 Productive Use Container (PUC)

The productive use, business-container concept has been designed to facilitate small business development in remote rural areas. The PUC is an integrated, remote business platform developed to promote rural enterprise in under-resourced areas. While the successful application of the container-concept will require certain base-line conditions, these conditions are fairly common in rural locales in developing countries, imbuing the concept with an important generic status. The choice of a relatively mobile structure – a freight container – and the reliance on renewable energy [PV electricity] ensures that the hardware further reinforces the generic status of the model.

The selection of businesses to occupy the Productive Use Container (PUC) was made on the basis of an identified set of priority areas for business intervention in Developing Countries. These sectors include:

- *Food processing* offers a value adding opportunity for agricultural products. With post-harvest losses in Developing Countries exceeding 50% and unemployment significantly higher, off-farm value adding processes are vital. These will extend markets for agricultural products as well as creating employment opportunities.

- The benefits of modern *telecommunication technologies* need to be extended to remote regions of developing countries. Communications can play a significant role in business, educational, health and civic development initiatives in the Developing World.

- *Improved energy options and services* have been identified as key socio-economic and environmental development indicators. Health and safety, environmental, commercial and education considerations point towards the benefits of improved energy supply and service options.

- The development of *business support services* will provide the kind of service infrastructure that broader economic growth requires. The concept of developing a business around the consolidation of support services addresses the need to overcome the high capital cost of equipment that is only intermittently required.

7.2 Solar Bakery

The village sun oven is the centre of this bakery business. The sun oven, a concept developed by SUN OVENS International, Inc, is a durable and innovative off-grid and renewable construction which has opened up opportunities for micro-enterprise in developing countries. The sun oven can bake, boil, cook and sterilise enabling it to fulfil a number of services in rural communities. The business application discussed here is a

commercial bakery. The bakery contributes to the food production and processing sector which was identified as an opportunity sector on the basis of the in-country analysis.

The bakery produces breads, buns and cakes providing for both the mass market (bread) as well as a niche market (buns and cakes). In most rural locales while bread is generally available, the source is frequently outside the local economy. This particular micro-enterprise is capable of both servicing a valued local need as well as keeping the money spent on such services within the local economy. The Village sun stove ably demonstrates the mainstream applicability and commercial capacities of renewable energy.

7.3 Integrated mini-grid

The productive use mini-grid is a stand-alone power generation system that provides 220V AC power. This integrated mini-grid acts as a business opportunity platform upon which a range of downstream businesses are developed. While the concept is generic in that a range of different business opportunities – from different sectors – might be considered, the model discussed below is centred on the promotion of commercial farming. With agriculture at the centre, a number of off-farm support businesses have been added. These offer a range of value adding services to agricultural products that will assist in accessing broader market opportunities. While agriculture remains the primary commercial thrust, addition commercial opportunities are developed around parallel market opportunities.

The mini-grid is centred on bio-gas which is produced by means of a digester. Animal waste is the principle input, the gas from which is used to drive a modified petrol generator[17]. The downstream businesses are designed to facilitate the commercialisation of agriculture. Such businesses include post harvest processing, food drying and packaging, a butchery, a chicken broiler, as well as a transport and communications business.

8 Dissemination of business models

8.1 Introduction

The dissemination report outlines the manner in which the Productive Use business models ultimately make their way into the market place. Once the market needs have been identified and appropriate business models developed, the next step is to engage with governments, organisations and agencies to facilitate the process of implementation. To date, this has been the shortcoming in what has become the productive use field. As with development in general, success and failure are determined not necessarily by the

[17] Modifications include a venturi to accommodate the low pressure of biogas.

paucity or quality of ideas but by their application. While many development proposals and concepts never achieve implementation status many that do fail due to the manner in which the implementation process is managed.

The current development paradigm is one that recognises the value of local input and control. The 'scientific positivism[18]' which characterised development in the post war period has given way to a far more participatory ethos. While democratic ideals and notions of self-determination assisted in shaping this new vision, perhaps more influential was the recognition of 'local knowledge'; a body of learned and rational knowledge developed in responses to local conditions. What the positivism of the post-war period failed to acknowledge was the importance of the participation and buy-in of the local beneficiaries. The process promoted here is one that situates the productive use initiative within a framework of local and regional capacities; an infrastructure for local control.

The process of identifying avenues for local participation should start at the policy or public level. No productive use or any other development initiative for that matter is strictly without precedence. Developing countries, such as Zambia and Tanzania, have been the focus of development initiatives and activities for many decades now. While the intellectual processes driving these initiatives have changed, the objective has remained the same, the elimination of poverty, the improvement of access to resources and the introduction of more sustainable livelihoods. Through this short history of development activity, despite the numerous failures, development infrastructure and intellectual capital has been developed. From public development agencies to community-based organisations (CBO) and non-governmental organisations (NGO), this infrastructure represents the pathway to effective implementation. If the project is to achieve the necessary buy-in at the local level, and in terms of appealing to international development agencies, the appropriate development pathways and portals need to be followed[19].

8.2 Identifying government programmes

The first issue that needs to be addressed here is what existing government or national programmes accord most closely or overlap with the intentions behind the productive use initiative? Given the more recent history of IMF and World Bank intervention, a United Nations Development Assistance Framework (UNDAF) has been developed for both Zambia and Tanzania. This framework has identified reform and development priorities through which other bi-lateral (including other UN agencies) and national development programmes are managed.

The World Bank, through the UNDAF, has identified a number of important linkages which interconnect the energy sector with the drivers of economic and social

[18] The philosophical position of positivism was essentially that society could be studied scientifically. What this meant for development was that the nuances and relative positions experienced across societies were largely overlooked.

[19] It should be said that these pathways represent the access points of development which provide guidance and linkages with similar projects as opposed to representing project management facilities.

development. In short, these have been identified as a means of ensuring that the energy sector is in a position to facilitate development. Looking at the World Bank country assistance development strategy for the two countries, there are a number of these linkages that are important conduits for identifying appropriate national programmes through which to implement the productive use concepts. These include:

- **Linkage One:** *Energy to fight poverty: Agriculture and development*

Improved energy supplies and access to such resources is key to the World Bank's 'inclusivity' approach to growth. This is important for widening the development net and putting energy in the hands of the community. This linkage and accompanying strategies place considerable emphasis on the use of renewable energy, and private sector investment/solutions.

Programmes: (Tanzania)

UNDP aims at strengthening national capacity for poverty monitoring and effective aid co-ordination between national and international players. programmes include:

- Poverty alleviation Programme
- National Incomes Generation Programme (NIGP)

Canadian Government (Bilateral)

- Mennonite Economic Development Associates (MEDIA)
- Canada Fund for local initiatives
- Tanzania Reconstruction Fund

The Agricultural Sector Programme Support. (Denmark)

- The programme concentrates on the institutional strengthening of farm seed production, small holder irrigation projects, rock phosphate research and environment conservation

German Government

- Energy Efficiency Improvement Program

Irish Government

- Improvement of food security.

The Netherlands

- Rural Development:

  Eleven districts are taking part in the programme – namely Biharamulo, Bukoba, Kahama, Karagwe, Kondoa, Maswa, Mbulu, Meatu, Monduli, Songea and Ngara. The programme is in the third phase and aims at increasing local ownership and responsibility for implementation of District Development Funds and an increased role of the Central Government support for the districts. Other programs includes the Multilateral Debt Fund, environment, infrastructure and women in development.

Programmes: (Zambia)

Irish Aid

- The primary objective of the Zambia Country Programme is poverty alleviation through support for the essential social sectors such as health, education, water, sanitation as well as income generation; support is also given through capacity building at community, local and national level in order to maximise the capacity and involvement of the Zambian people in their own development.

Germany
- Agriculture and decentralized development planning

Netherlands (Netherlands Development Organisation)
- AGRIC-M: Agricultural support, Mwinilunga

♦ **Linkage Two:** *Energy and the environment*

The impact of current, unsustainable, patterns of energy consumption on the environment has been recognised in both Zambia and Tanzania. Principle concern in this regard is given to the exploitation and use of traditional fuels. The productive use concepts developed in this document address themselves directly to this issue, by demonstrating the use of renewable energy sources in their application. Zambia's

Programmes: (Tanzania)

Environmental Support Programme: (Denmark)
- Sustainable Arusha programme
- Village based forest and woodland management in Lindi Region.
- Sustainable Mwanza Programme

Sweden
- National Environment Management Council

USA
- Participatory environment resource management project.

Programmes (Zambia)

Netherlands
- Development and promotion of conservation farming/agro-processing, as a promising alternative for increasing production. Gender and environmental aspects will get special attention;

♦ **Linkage three:** *Public/Private partnerships: Energy, finance and development*

The World Bank regards direct private participation as important, providing greater efficiency approaches to the commercialisation of services and former 'regulated' sectors. Greater commercial accountability will open further opportunities for the development of local/micro financing infrastructure. Access to credit and business development assistance are important strategies for local development.

Programmes (Tanzania)

Institutional Support. (Denmark)
- Vocational Education and Training.
- Strengthening Co-operative and Rural Development Bank (CRDB).
- Development of Micro Finance.

Norway
- Promotion of Rural Initiatives and Development Enterprises (PRIDE) in Arusha, Tanga and Dar es Salaam.

The UK

- Private Sector Development: Focusing on small and medium scale enterprises, including export marketing. Other plans in the pipeline include a business support programme and income – generating programme for women

Programmes: (Zambia)

UNIDO

- SME development; contributing towards a strong indigenous private sector

Netherlands

- Support to the Rural Investment Fund (RIF); a initiative under ASIP, directed towards financing productive community activities in agriculture, including capacity building and institutional strengthening;

Germany

- Privatisation and private sector development;

8.3 Relevant Government Departments and organisations

Zambia

Department of Energy - Zambia
Planning Unit, Ministry of Energy and Water Development - Zambia
Environment and Energy Concerns for Zambia (Geoffrey Musonda)
Office for the Promotion of Private Sector Investment OPPPI (Stephen Phiri)
Small Enterprise Development Board (Margaret G. Kombe)

Tanzania

Ministry of Agriculture and Food Security (Tanzania)
Tanzania Commission for Science and Technology (COSTECH)
Centre for the Development and Transfer of Technology (CDTT)
Centre for Agricultural Mechanization and Rural Technology
Tanzania Private Sector Foundation (TPSF)

8.4 Identifying local facilitating organisations

A list of in-country organisations is provided below. The utilisation of in-country facilitating organisations such as NGOs and CBOs has a number of advantages. First, such organisations generally have developed a considerable portfolio of experience within the country and have much to offer in terms of identifying and ensuring access to local communities. Through this experience base, relations of trust might have been established between these organisations and local communities. These kinds of partnerships also represent good opportunities for local capacity building, exposing local organisations to different technologies, ideas and development priorities. Finally, many international funding and/or development agencies insist on partnerships with local organisations.

Tanzania

- **Tanzania Solar Energy Association (TASEA)**

TASEA is a Non Governmental, Non Profit and Non -Partisan association that networks NGOs, Private Companies, Government and Research Institutions in order to spearhead development of solar energy industry in Tanzania . The Solar Energy in this case, encompasses direct solar energy application like thermal, photovoltaic and photochemistry and all other forms of energy originating from solar energy such as biomass, wind, hydro and tidal energy. The core objective of TASEA is to promote and advance the science and application of solar energy in Tanzania by encouraging solar energy research and education,. disseminate solar energy knowledge and information, creating solar energy opportunities, encourage high standards of design, manufacture, installation, usage and marketing for solar equipment, provide forum for discussion on the development and dissemination of new technologies, building a solar information base, provide assistance to technologists practicing solar energy, formulate and undertake programmes and projects. The partnership of TASEA has grown to more than 30 organisations. (http://www.tatedo.org/networks.htm)

- **SADC-Center for Sustainable Rural Energy Development**

SADC is short term of Southern Africa Development Community. It was transformed from conference to the community in August 1992, when the Heads of State and Government of the Southern African Development Co-ordination Conference met in Windhoek, Namibia, to sign a Declaration and Treaty establishing the new SADC - the Southern African Development Community. There was a need to shift the focus of the organisation from co-ordination of development projects to a more complex task of integrating the economies of member States. The ultimate objective of SADC is, therefore, to build a Region in which there will be a high degree of harmonisation and rationalisation to enable the pooling of resources to achieve collective self-reliance in order to improve the living standards of the people of the region.

TaTEDO in partnership with Commission of Science and Technology (COSTECH) and National Social Welfare Training Institute (NSWTI) are the SADC Regional Centre of Sustainable Rural Energy Development. The centre is expected to fulfill the role of "think tank" to promote methodology development and performance investigations and analysis in the rural energy development as a means of policy and strategy development for improved land degradation and desertification control. More specifically, the centre is supposed to create a network of institutions in rural energy development and link up with them. Member countries are to propose the list of institutions, together with existing centre of excellence in environmental law, range management and village level planning for collaborating and networking in order to exchange the experiences of energy and environment available in the SADC countries. The centre has role of networking with related institutions in the SADC member countries, production of guidelines and training manuals, conduct training of trainers and other national experts and production of concept/policy/technical papers for distribution to policy makers in the region. (http://www.tatedo.org/networks.htm)

- **East African Energy Technology Development Network (EAETDN)**
  TaTEDO also collaborates with an NGO called Intermediate Technology Development Group (ITDG) of Kenya to run the East African Energy Technology Development Network (EAETDN). The main objective of this network is to facilitate the sharing and dissemination of energy information. This is expected to contribute to the capacity building, transfer of skills, and creation of common voice in lobbying and advocacy in energy policy issues. The network is also involved with improvement of the capacity of the network partners in the regions. Specifically, the network intends to cover the following areas:
    - to develop or implement energy related poverty alleviation programmes,
    - to increase information sharing and networking amongst the organisations working in energy in the regions
    - to increasing capacity of the network organisations to lobby for policies that support energy technology use in small enterprises development.
    - to improve monitoring and evaluation of partners work on energy technology development and use.
    - ITDG and TaTEDO partners shares and exchange the information, knowledge and experiences related to energy technologies development in relation to poverty eradication through EAETDN

Economic and Social Research Foundation (ESRF)
http://www.esrf.or.tz E-mail: esrf@twiga.com

The primary objectives of the Foundation are to strengthen capabilities and development management and to enhance the understanding of policy options in the Government, the public sector, civil society, the donor community and the growing private sector.

Tanzania Association of Non – Governmental Organizations (TANGO)
http://www.tango.or.tz E-mail: tango@africaonline.co.tz

TANGO is the largest and longest standing national umbrella organization serving the Tanzania NGO community.

United Nations International Fund for Agricultural Development (IFAD)
http://www.ifad.org E-mail : ifad@ifad.org

IFAD works with NGOs who have a significant role to play in assisting the rural poor in breaking out of their condition of poverty.

National Development Corporation (NDC)
http://www.ndctz.com/ Contact: David Basu e-mail: ndc@cats-net.com

NDC is a Government funding agency dealing with development issues within the country.

Zambia

CEEEZ - Centre For Energy, Environment and Engineering Zambia Ltd

Centre For Energy, Environment and Engineering Zambia Ltd (CEEEZ) is a non governmental organisation which is independent and non profit making in its activities. Its major activities involve collaborating with Government and various institutions in the country and overseas in the fields of energy, environment and engineering. The specific role of CEEEZ is to investigate, analyze and make useful conclusions and policy recommendations on energy, environment and engineering concerns. In addition, CEEEZ carries out studies, research and development, consultancy and training in the areas of energy, environment and engineering.

Energy is a vital input in economic development. Production and use of energy often leads to environmental degradation. In many cases government, energy producers and industrialists are not aware of sound energy and environment management. In addition, they often lack technical expertise to derive sound policy analysis which is necessary to support relevant practices. There is need, therefore, to have independent research institutions that can co-operate with government and industrialists in finding means of ensuring harmony between economic development and the protection of the environment. CEEEZ works to fill this gap.

CEEEZ has been involved in a number of consultancies on energy and environment issues among them being the Zambia Country Study on Climate Change a greenhouse gas emission study supported by Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ).

The Government of the Republic of Zambia is committed to the UNFCCC and sees CDM as a key element in this process. It also sees CDM as a cost-effective means by which to benefit from the transfer of technology from the Annex I countries, and the financing of key development, particularly in the mining and agricultural sectors. Beyond actively participating in all COPs under the UNFCCC, Zambia is trying to set the framework for CDM. In February 1999, the Minister of Environment and Natural Resources held a one-day workshop on CDM with all relevant ministries and stakeholder. Governments and stakeholders' priorities for baseline development include household energy, transport, agriculture and forestry, industry, and mining. For mitigation and sustainable development, key stakeholders have prioritised household energy linked to forestry, and the mining, industrial and transport sectors.

Co-operative League of the USA (CLUSA)

Natural Resources Management Project in Eastern province

Energy and Environmental Concerns for Zambia (EECZ)

Grouping of Researchers, Academics and Policy Makers Involved in the Promotion and Development of Sustainable Energy

Zambian Association for Research and Development (ZARD)

THE Zambia Association for Research and Development (ZARD), founded in 1984, seeks to work with other local and international NGOs. ZARD's vision is to achieve gender equality in Zambia. To achieve this, the Organisation is committed to carrying out gender-sensitive research and undertake consultancy, publishing, advocacy and networking aimed at empowering women. It has more than 500 members.

9 Funding opportunities

A detailed list of funding opportunities has been included in Appendix A.

10 Enterprise Development Assistance

Enterprise Development Assistance can be discussed in terms of pre implementation assistance, implementation assistance and Post implementation assistance. Experience with pre implementation assistance has shown the majority of time and resources spend on compiling the business plan. As mentioned earlier the existence of the Productive Use Kit will eliminate this need allowing for more attention to be given to the successful implementation of the venture. Organizations providing this pre implementation assistance would typically assist with identifying relevant legal issues, identifying suitable suppliers, establishing distribution channels, refining area specific marketing strategies and establishing operational practices. Implementation assistance would involve providing managerial expertise on actual implementation of the Productive Use Kit. Finally Post Implementation EDA will monitor the progress of the venture in terms of budgeted to actual sales, expenses and implementation schedules.

11 Monitoring and Evaluation

There are effectively two approaches – which should be combined – to the monitoring and evaluation (M&E) requirements of PU initiatives. The first of these concerns asset management, the responsibility of the financier to ensure that their investments are on a sure footing. This mechanics of this process will be determined by the investor. The second component of monitoring and evaluation concerns the responsibilities of the developer/implementer in ensuring that the total co-ordinates of the PU initiative are being effectively managed. Clearly, however, the two are not mutually exclusive.

The shared objective is to ensure that the project succeeds, that it achieves sustainability as quickly as possible. However, the financier and the implementing agencies have different resources and skills. While the responsibilities of the financier would be to

ensure that the investment is well managed, there is a limit to what interventions the financier can suggest regarding the broader dynamics of rural development. The implementing[20] agency is principally responsible for ensuring that factors at the local level are conducive to the success to the project. These factors include community co-operation, local availability and access to supplies, the capacity of the entrepreneur, etc. The financier will have to determine whether the character of the business operation is likely to succeed and if not, what issues need to be addressed. The manner in which this interaction is to be managed needs to be determined by the parties involved. Different kinds of relationships will emerge from the involvement of different financing institutions and implementing agencies.

The M&E period has an important role to play both in the success of the initiative as well as in the publication and communication of materials pertaining to the management of PU activities. In order to avoid duplication of errors and to contribute to a body of knowledge and the development of an appropriate experience base, the M&E process must be attendant to any PU venture. One cannot prescribe the duration of the M&E but perhaps we can point out the likelihood that the demands will vary over the M&E period. During the earlier stages, such demands will be more intense as the enterprise finds its feet. In time, such demands will wane only to pick up towards the end of the M&E process where final assessments will have to be made. There are a number of different management options for the M&E process. These include the involvement of local partnership organisations (NGOs, CBOs, etc) and other local possibilities.

Tertiary institutions are increasing focusing on small business development which provides an opportunity for senior or graduate students to gain vital work experience. When the M&E demands plateau during the middle stages of the process, this might present an opportunity for involving such as student in the M&E process. By using local organisations and individuals, the PU project contributes to capacity building as well as benefiting from a more convenient, both in terms of costs and time, arrangement.

The key areas in M&E are the following; ensuring the business(s) effectively employ the knowledge provided including issues such as book-keeping, marketing, customer service, procurement, community relations, etc. There is no template or rigid list, the focus of the M&E period should include all the factors that might impact on the performance of the enterprise.

12 Conclusion

It is difficult to say what area of specialisation constitutes a ‘field’ of study and this is particularly true of productive use. But definitions aside, there has been increasing interest in PU programmes internationally. If well considered, they offer a genuine

[20] Where appropriate this would include local partnership organisations

opportunity to contribute to development objectives through the creation of income generating opportunities

The principle objective of this document is to contribute towards mapping a path for successful PU interventions. The difficulties brought about by the absence of a procedural framework represent a significant barrier to the promotion of productive use activities on an international basis. The business models such as those contained in the report are the raw materials of productive use, materials that need refining or processing through a concomitant framework which both acknowledges and manages the complexities of implementation. The distinction between standard format business models and the great variances in the contexts of application mirrors the challenges faced in developing such a standardised approach. However, as this report suggests, a framework or set of considerations does not prejudge characteristics of a particular implementation environment but rather, draws attention to the need to appraise such characteristics in the context of each application.

There are no fantastically innovative short cuts to productive use projects: no one-size fits all. Instead, the best we can do, and this is an objective to which this report is intended to contribute, is to define a generic process for conceptualising PU opportunities and ensuring the effective implementation and management of these activities.

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1 Productive Use Container

1.1 Introduction

1.1.1 Planning and methodology

The productive use, business-container concept has been designed to facilitate small business development in remote rural areas. While the successful application of the container-concept will require certain base-line conditions, these conditions are fairly common in rural locales in developing countries, imbuing the concept with an important generic status. The choice of a relatively mobile structure – a freight container – and the reliance on renewable energy [PV electricity] ensures that the hardware further reinforces the generic status of the model.

A number of obstacles to the facilitation of small businesses – or entrepreneurship – in rural areas of developing countries have been addressed within the conceptualisation and design of the business-container package. The package offers secure business premises, off-grid power solutions, detailed business plans as well as professional business and technical training.

The development of a business *package* is an acknowledgement that the problems prospective entrepreneurs face are varied and require holistic solutions. The container package represents an integrated solution to the problems entrepreneurs confront in the developing world.

Generic planning considerations include:

- Examination of macro and micro obstacles to the promotion of entrepreneurship in the host country/region
- Close audit of existing and future energy infrastructure plans

1.1.2 Selection of businesses

The selection of businesses to occupy the Productive Use Container (PUC) was made on the basis of an identified set of priority areas for business intervention in Developing Countries. These sectors include:

- *Food processing* offers a value adding opportunity for agricultural products. With post-harvest losses in Developing Countries exceeding 50% and unemployment significantly higher, off-farm value adding processes are vital. These will extend markets for agricultural products as well as creating employment opportunities.

- The benefits of modern *telecommunication technologies* need to be extended to remote regions of developing countries. Communications can play a significant role in business, educational, health and civic development initiatives in the Developing World.

- *Improved energy options and services* have been identified as key socio-economic and environmental development indicators. Health and safety, environmental, commercial and education considerations point towards the benefits of improved energy supply and service options.

- The development of *business support services* will provide the kind of service infrastructure that broader economic growth requires. The concept of developing a business around the consolidation of support services addresses the need to overcome the high capital cost of equipment that is only intermittently required.

The selection was further defined on the basis of the suitability of the business mix. The rationale here was that these commercial centres can profit from a degree of co-dependency where related products or services are provided. Additionally, the right business mix might appeal more broadly to consumers – opportunistic consumers - as opposed to each business unit operating entirely on specific-needs defined markets.

The business mix is complementary on a number of levels. For instance, the electronic repairs and solar PV retailer provides electricity to the other 4 businesses. In doing so, he creates energy-based opportunities for the other entrepreneurs while at the same time ensuring a basic income for his/her business. The barber is positioned to benefit from customers whose original intention was to visit one of the neighbouring businesses. Similarly, the barber's customers might at the same time purchase pre-paid phone vouchers from the communications business. While this principle is openly applied in suburban shopping centres and other commercial centres, the PUC employs the same principles in remote rural areas where dispersed settlements and a lack of funds generally stand in the way of its successful application.

Businesses are described in general terms only; the detail of each will be contained in each of the separate business plans.

Enterprise #1: Business services
A One-person operation that can deliver a variety of computer related services, together with business related services and computer training. Some services would be charged for on an hourly rate whilst others would be subject to a flat rate.

Enterprise #2: Communication – public cellular service & accessories
A public cellular phone service, allowing people to make calls and pay per unit, thereby spending only on the service as required. The owner will charge fixed rates that will include a profit margin. Parallel to the public call service, the business will retail a limited number of complementary products and accessories, mainly pre-paid vouchers for those individuals that own a cellular phone.

Enterprise #3: Food – produce processing and sales
Fresh produce, specifically fruit in season will be processed into juice and sold in containers suitable for immediate consumption. Some fruit juices can be blended with apple juice, if the latter is available in sufficient quantities. Complementary to this, the fruit itself and other processed products can be sold to enhance overall profitability.

Enterprise #4: Energy – electronic repairs and solar PV retailer
This specific business will be responsible for the entire solar PV system and will sell electricity to the other 4 businesses. Furthermore, the activity of repairing household electronic appliances is combined with retailing a number of solar PV related products including Solar Home Systems for lighting and entertainment (radio and TV) power. In addition, the entrepreneur will offer repair and maintenance contracts for private SHS owners.

Enterprise #5: Social service – barber

The barber operation will be the normal hair trimming service generally associated with this type of business. Depending on the local market, related products and accessories could be sold.

1.1.3 Location

- The PUC should be located at least 10km from existing or planned electricity grid lines. The pilot location is approximately 15km from the nearest grid line.
- Household density should be no less than 5hh/km². The pilot location has an average household density of 5.1hh/km² in a 10km radius (app. 1 600 hhs).
- The site should not compete with existing business centres. The pilot is located some 15km from the nearest recognisable business centre.
- The chosen site should fall under a single municipality or equivalent local government structure. The pilot site and market radius fall within the Local Municipality 272.

1.2 Ownership

1.2.1 Ownership of container and energy system

It is envisaged that ownership of the container and the energy system will pass to one or more of the entrepreneurs in the PU container. At this stage it is planned to assist the owner of the *Business Services* business to become owner of the physical container whilst the owner of the *Energy & Electrical* business will be assisted to own the energy system.

The owner of the container will rent space to each individual business in the container and the owner of the energy system will likewise sell electricity. The tariffs for rent and electricity are calculated below under separate headings.

1.2.2 Rent and electricity tariffs

The respective tariffs will be calculated taking a variety of factors into account. The main factor will however be the cash flow situation. Tariffs are thus structured in such a way that the respective owners will not find themselves in a negative cash flow situation. Although the tariffs are discussed in more detail below, the detail can be summarized as follows:

Rent tariffs:

Business	Dimensions	Area (m²)	% use	R	€
Juice manufacturer	3m x 1,2m	3.6	12.5%	179.38	17.94
Barber	3m x 1,2m	3.6	12.5%	179.38	17.94

Cell shop	3m x 2,4m	7.2	25.0%	358.75	35.88
Business services	3m x 2,4m	7.2	25.0%	358.75	35.88
Energy & electrical services	3m x 2,4m	7.2	25.0%	358.75	35.88
Total		**28.8**	**100.0%**	**1,435.00**	**143.50**

Electricity tariffs:

Description	Wh requirement	% requirement	R	€
Barber	341.00	23.9%	348.10	34.81
Cell shop	323.00	22.7%	329.72	32.97
Energy & electrical	121.00	8.5%	123.52	12.35
Business services	369.00	25.9%	376.68	37.67
Fruit juice	271.00	19.0%	276.64	27.66
Total	1,425.00	100.0%	1,454.66	145.47

1.2.3 Argument for a single owner

The options for ownership are twofold, namely:

- A partnership of one form or another between 2 or more tenants
- A single owner

The partnership option has a number of disadvantages that would prompt the financier to steer away from it. Firstly, and in general terms, the lower the sophistication level and business maturity of the possible partners, the less chance of the partnership enduring. Secondly, a partnership implies some form of legal entity, resulting in legal agreements, legal costs and difficulty in legal litigation. Thirdly, the individual partners would generally insist on limited surety, limited to the extent of their ownership and/or share in the partnership. This implies very cumbersome legal documentation and limited litigation options to the financier.

A single owner, whether through a legal entity or not, is simpler to finance, easier to implement and safer in terms of litigation.

1.2.4 Rent calculation

Whether it is immovable property or a mobile unit, the general principle in calculating rental remains the same, viz the application of a capitilization rate in relation to the value of the rented space. This results in the required net rental which is then adjusted to allow for costs involved in owning and renting the said space. The emphasis here is on the required return on investment and not on cash flow.

In the case of a container, this methodology could be applied only if cash flow was not a consideration, for example in the case of a cash investment. However, given the typical business and socio-economic milieu for which the container concept is developed, the cost of the container will most likely be fully financed.

In such a case, cash flow becomes the predominant criteria in calculating a suitable rental and the return on investment is secondary in importance. In order to ensure that the owner (entrepreneur/landlord) achieves cash breakeven from the outset, the method of calculating a rental will be based on the monthly cash requirement (of which the bulk would be the loan instalment) for which he is liable. More specifically, the calculation of rent tariffs is based on the following assumptions:

- The cost of the container includes:
  - Cost of acquisition
  - Cost of conversion, including fittings and shelving
  - Cost of transport to the site
  - Cost of site preparation
  - Commissioning of container
- Tenants only pay for exclusive and/or business specific fixtures.
- The total cost of the container will be financed at:
  - A term of 6 years
  - An interest rate equal to the prime lending rate
- Rental tariffs will be based on loan instalments plus related ownership costs such as rates, taxes, insurance and maintenance.

The total container cost, and therefore the loan amount, is R62 150-00 (€6215-00). Over a 6 year term (72 months) at an annual interest rate of 15%, the monthly instalment is R1 315-00 (€131-50).

The monthly cash requirement is therefore:

Description	**R**	**€**
Loan instalment	1,315.00	131.50
Rates and taxes	-	-
Maintenance	120.00	12.00
Insurance	-	-
Total	**1,435.00**	**143.50**

The container and individual shops have the following dimensions, and will contribute towards the monthly cash requirement according to their individual percentage use of available floor space:

Business	**Dimensions**	**Area (m²)**	**% use**	**R**	**€**
Juice manufacturer	3m x 1,2m	3.6	12.5%	179.38	17.94
Barber	3m x 1,2m	3.6	12.5%	179.38	17.94
Cell shop	3m x 2,4m	7.2	25.0%	358.75	35.88
Business services	3m x 2,4m	7.2	25.0%	358.75	35.88
Energy & electrical services	3m x 2,4m	7.2	25.0%	358.75	35.88
Total		**28.8**	**100.0%**	**1,435.00**	**143.50**

1.2.5 Return on Investment

The entrepreneur's return on his "business premises" investment, is calculated as follows:

	Description	Detail	R	€
	First year gross rent	12 x R1 435-00	17,220.00	1722
Less:	Actual costs	12 x R 120-00	1,440.00	144
Less:	First year interest		8,870.29	887.029
Equals:	First year net rent		6,909.71	690.971
	Return on investment		11.1%	

In order to further improve the return on investment, the entrepreneur can build an escalation clause into the lease agreement. With the monthly cash requirement remaining constant, such an increase will significantly improve both the cash flow and the return.

1.2.6 Administration

There are two possible administrative processes: the owner could collect the rent each month from the renting businesses or the businesses would deposit the rental amount directly into the owners bank account. The latter is premised on the owner having an account, which is a fair assumption given the owner would have acquired financing through a financial institution. However, this arrangement also assumes that the occupying businesses would also have access to the bank. Given the typically remote location of the business container, the first administrative - the owner collects the monthly rental - option appears more credible.
The owner should attempt to synchronise payments between the businesses for the purpose of effective administration. It is recommended that businesses assuming occupation after the 1st of the month pay a pro rata value for the number of days that remain in the month. This would ultimately ensure that rentals were based on calendar months rather than simply equivalent periods.

1.3 Energy supply

1.3.1 Identifying appropriate energy supply

The choice was confined to renewable energy sources. Of the renewable fuels available, PV electricity was considered the most practical energy supply option for the business container. It is a clean, renewable fuel that is well suited to remote applications.

Wind energy was not considered given the average wind speed requirements for effective utilisation of this renewable resource. Optimal wind speeds are of the order of about 6m/second whereas the average wind speed for the northern Kzn region is of the magnitude of 2-4m/second. In addition, the motor required for a wind turbine would significantly increase system maintenance costs. Similarly, micro-hydro systems were not considered because of the lack of suitable streams/dams near the pilot site.

Generic model considerations include:

- Examination of wind speed data and local manufacturing capacity with regard to wind turbines.
- Investigation linkages with existing mini-grid and mini-hydro projects.
  Decision needs to be made vis-à-vis the quality of component parts. Higher quality will lower replacement and/or repairs but availability needs to be factored into ultimate decision.

1.3.2 System design

The system is designed as an integrated solar system with a solar array consisting of ten (10) 55Wp modules and a 24v battery bank consisting of 1000Ah heavy-duty deep cycle batteries. The power output will be 220V. The mounted control cubicle includes a regulator, load-shed protection, isolators and earth leakage protection. High quality components, including the inverter, have been sourced to ensure maximum reliability.

Wiring will all be internal with wires passing through conduit piping between the array, battery bank, distribution board and the output points. Each business will have a single power outlet and two mounted 11W lights. The container will have four external security lights one of which will be active all night while the remaining three will be motion activated.

The system will include 20% spare capacity to allow for additional business applications as well as changes in the actual businesses operating in the container. The module mounts can also accommodate additional PV panels for further power supply requirements.

Generic model considerations:

- Appropriate and professional sizing of power source is crucial.
- Design should accommodate future increases in requirement both in terms of system size and capacity to extend.
- Placing of internal electrical fixtures need to conform to or enhance individual business energy requirements.
- A close assessment of security issues need to be factored into the energy system requirements
- An investigation of the availability of system components and maintenance options should inform the choice of system components.

1.3.3 System costs

The integrated system costs are summarised in the table below:

Description	Detail	Monthly (R)	Monthly €
System cost	R57 765-00 (€5 776-00) @ 15% over 120 months	931.95	93.195
Battery bank cost	R15 210 (€1 521-00)@15% over 84 months	293.50	29.35
Recurring costs	6 batteries @ R15 210 (€1 521-00)over 84 months	181.07	18.107
Maintenance costs	1% of system cost over 12 months	48.14	4.814
Total		1,454.66	145.47

The system will be financed over a 10-year period while the batteries, given the shorter life cycle, will be funded over a 7-year period. Recurring cost payments have been integrated into the total costs to ensure the entrepreneur will not have to arrange additional finance for the replacement of the battery bank. Maintenance costs have been determined at 1% of system costs.
The monthly system costs will be recouped through the sale of electricity to adjacent businesses within the container. Payments are determined by the Wh requirements of the businesses within the container and the percentage this figure represents in terms of total container energy requirements.

The table below summarises these payments.

Description	Wh requirement	% requirement	R	€
Barber	341.00	23.9%	348.10	34.81
Cell shop	323.00	22.7%	329.72	32.97
Energy & electrical	121.00	8.5%	123.52	12.35
Business services	369.00	25.9%	376.68	37.67
Fruit juice	271.00	19.0%	276.64	27.66
Total	1,425.00	100.0%	1,454.66	145.47

1.3.4 Electricity cost

The cost of electricity within the container was not compared to the cost of electricity as supplied by the local grid. The reason being that the cost of grid electricity was never a factor in the development of the PU container, and it was never seen as an alternative to grid electricity. It is rather the lack of grid electricity that motivated the search for an alternative way to supply power to the 5 businesses. The chosen alternative is a way to overcome the lack of power and to establish 5 businesses where previously they would not have been able to exist at all.

Another aspect to keep in mind is financial viability. If the businesses proves to be financially viable purely because of “in-expensive” grid electricity, then one could argue that they are not truly viable, but only marginally viable with a relatively small safety factor. On the other hand, if the businesses proves to be financially viable with the “expensive” PV electricity, the price of that electricity becomes irrelevant since it is only one of a variety of overhead expenses that needs to be covered each month.

1.3.5 Load profile & thresholds

The power requirements of the individual businesses are summarised below. While four of the five businesses share similar Wh requirements, the specific appliances that comprise this requirement distinguish them.

Description	Wh requirement	% requirement
Barber	341.00	23.9%
Cell shop	323.00	22.7%
Energy & electrical	121.00	8.5%
Business services	369.00	25.9%
Fruit juice	271.00	19.0%
Total	1,425.00	100.0%

Where there are a number of appliances, of similar power ratings, that contribute to the total Wh requirements of the business, the entrepreneur has greater flexibility in terms of the increasing the usage of one or another appliance. Where a single appliance, as in the case of the juicer, largely determines the Wh requirements, that business will have to conform closely with the energy requirements table if the system's capabilities are not to be critically exceeded. In short, the lower the power rating of the appliance or energy application, the higher the tolerable usage threshold.

2 Business Plan: Bakery

2.1 Description of business

2.1.1 Core activities

The core activity will be the production of baked wheat products such as bread, buns and cakes using the Villager Sun Oven.

2.1.2 Location

An ideal business site for the venture would have the following characteristics:

- Is a rural or sub-urban area
- The premises should be located at least 10km from existing or planned electricity grid lines
- A population of 2000 households or more within a radius of 15km
- Near or at a place of gathering such as a market or clinic
- Have a means of receiving raw material inputs
- Have clean water

2.1.3 Ownership structure

The business will be owned and operated as a sole proprietor.

2.1.4 General legal issues

The following legal issues should be considered:

- Ownership structure

- Trading licence or permit
- Income tax, both business and personal
- VAT
- Other country specific taxes, duties and/or levies
- Local or community authority
- Lease agreement
- Power supply agreement
- Trading hours permitted

2.2 Detail of product and service

2.2.1 Detailed description

The business will provide three product lines, these will include:

- Loaves of bread
- Cakes for festive occasions

Producing the wheat products will entail the procurement of suitable raw material inputs on a regular basis and cool dry storage of those products. The bread production will include the mixing of water, flour and yeast to make the dough. The dough is then weighed and cut into pieces using the dough divider. For the buns the dough is inserted into the bun pans. Once cut, the dough pieces are fermented. If a prover machine is available, the cut and weighed pieces are then placed in the subject machine for fermentation. Under ideal conditions the pieces are placed in the prover for 15 minutes. The dough pieces are then moulded and further fermented and then placed in the oven for baking. Once baked the bread is placed in a cooling room and ultimately packaged for sale.

For the cakes, egg yolks will be whisked with sugar until very stiff. The flour will be folded in along with the butter. The mixture will then be poured into a buttered and floured cake tin. The mixture will then be baked in the oven at a temperature of 1 70ºC for 35 to 45 minutes for a deep cake, 20 to 25 minutes for shallow cake. The cake is done when the edges have left the sides of the tin. Cool the cake on a wire rack. The cake will then be covered with a coloured icing topping made from icing sugar, butter, milk and colouring.

2.2.2 Suppliers

Raw material inputs for the bread and cakes will be obtained from the nearest commercial centre. Such raw materials would typically include, eggs, sugar, baking powder, milk, salt, vanilla essence, icing sugar, colouring, bread flour, cake flour, yeast, oil and margarine. Propane would also need to be sourced from an appropriate supplier to serve as a backup source of energy in the case of bad weather. Appropriate packaging for the bread, buns and cakes should be sourced.

2.3 Marketing Plan

2.3.1 Customer description

Three different types of customers will be targeted:

- General Public

These include customers who will buy directly from the bakery for reasons of freshness, proximity to household and convenience. These customers will typically buy loaves of bread or a various number of buns. These customers may be aged between 15 – 50 and may or may not be economically active.

- Spaza shops
  Spaza shops will be supplied with loaves of bread. These will be supplied on a pre-ordered basis daily. Spaza shops may also purchase cakes on order.

- Private Functions
  Cakes can be supplied for private functions in the area, such as weddings, funerals, birthdays and other festive occasions. At an extra cost the cakes may be decorated appropriately.

2.3.2 Typical expenditure

Typical expenditure can be discussed in terms of the three target customers described above:

- General Public
  Each household has an average of five persons and it can be estimated that each the households will consume 5 loaves of bread per week. In a rural area of this type a loaf of bread would cost approximately R4-00. This results in a total expenditure of R25-00 per week.

- Spaza shops
  The local spaza shop would typically procure 20 loaves of bread per week at a cost of R3-80 for a loaf of bread.

- Private Functions
  Households in the area will typically have at least one large social event every year. Such events entail the purchase of large amounts of food and beverages. It is estimated that one cake is bought for such an occasion at a retail price of R30-00.

  For the generic model, the following facts must be researched in terms of the typical customer groups:
- Frequency of consumption of bread, buns and cakes
- Amounts of bread consumed
- Price range of a similar product in the area

2.3.3 Customer potential

A total of 1500 households exist within a 15km radius of the location of the bakery, it is from these households that the total customer potential for each of the three target groups can be calculated.

- General Public
  It can be assumed that each household has at least one person who is either economically active or receives a monthly pension. Of those 2000 those persons it is estimated that 50% will not have access to the bakery and a further 30%

cannot afford or able to purchase the bread or buns. Hence 20% or 300 of this total target group are potential customers.

- Spaza Shops
  It is assumed that there will be 10 spaza (general dealers) within a 15km radius of the bakery and that 2 of these will purchase bread and buns from the bakery.

- Private Functions
  It can be conservatively estimated that of the total 1500 households within the area 5% (75) will purchase a cake for their annual festive occasion.

The generic model should ascertain the following:

- Total number of potential customers in each typical customer group with in the proposed location of the business
- Estimated percentage of that total that would actually consume the product

2.3.4 Competition

Competition will primarily exist in the form of the spaza shops, however they also have the potential of being customers. At present the community would only have access to bread and bun supplies from retailers at the main commercial centres which are located some distance from the target market. As a result the bread is often stale.

The generic model should gather information on competitors in terms of:

- Number and size of other sources of bread, buns and cakes in the area
- The retail price at which these sources are selling the product
- The competitive edge the business will have

2.3.5 Costing and pricing

The gross profit percentage for the bread, buns and cake will be approximately 50% on average (retail and wholesale).

Direct costs associated with bread and buns include:

- Flour
- Salt
- Sugar
- Yeast
- Oil
- Packaging

Direct costs associated with the cakes include:

- Eggs
- Sugar
- Baking Powder
- Milk
- Oil
- Salt
- Vanilla essence
- Margarine
- Colouring
- Icing sugar

The pricing for the bread, buns and cakes will be as follows:

		Retail	Wholesale
• Bread	-	R 4-00	R 3-80
• Cakes	-	R 30-00	

The generic model should ascertain the following:

- Determine the gross profit percentage for each of the products
- Determine the percentage each product will contribute to total turnover
- Determine the average gross profit for the products
- List the retail and wholesale prices for each of the product sizes

2.3.6 Unit sales

Unit sales for each of the three above mentioned target groups based on an estimated customer potential are as follows:

- General Public
  300 households will buy 4 loaves of bread a week which translates into 4800 loaves per month (200 loaves per day). This translates in to monthly sales of R19 200-00

- Spaza shops
  2 spaza shops will purchase 40 loaves of bread per week or 160 loaves per month resulting in sales of R608-00

- Private households
  75 cakes will be sold annually with an average of 6 per month. Sales from cakes will amount to R180-00

The generic model will determine the unit sales per month for each of the typical customer groups by multiplying the estimated number of customers by the estimated number of units to be consumed per month.

2.3.7 Marketing actions

Marketing actions will include the following:

- Flyers handed out at suitable places such as bus stops, pension payouts, market places
- Personal visits to the spaza shops
- Word of mouth

2.4 Operations plan

2.4.1 Entrepreneur

The typical entrepreneur will have the following profile:

- Male or Female
- Aged between 20 and 40.
- A member of the local community

- Literate
- Has basic knowledge of making and selling bread
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard
- High propensity to save

2.4.2 Key functions

The manufacture and sale of bread and cakes will involve the following functions:

- Production

- Procurement
  The purpose of timeous purchasing is to avoid out-of-stock situations. By using a checklist containing the minimum stock level for each product, the entrepreneur can place orders and/or arrange for delivery. Regarding pricing, the entrepreneur would apply a mark-up % in order to match the prices of competitors. As the business establishes itself and the entrepreneur gains experience, the pricing policy can be adjusted. Being the owner/operator, stock control should not pose a problem. All stock will be counted at the end of each month.

- Marketing and service delivery
  Good service delivery is directly dependent on the entrepreneur to ensure that it is delivered at an acceptable level on a continuous basis. Marketing actions can be planned weekly or monthly in advance and executed on the most appropriate time of the month.

- Cash control
  Cash is reconciled on a daily basis to account for all revenue and expenditure. This is then recorded in a cash book which will be summarized on a monthly basis. The monthly summaries will reflect the amount of profit realized.

2.5 Financial plan

2.5.1 Sales projection

The total projected sales for both bread and cakes amounts to R19 988-00 per month.

2.5.2 Overhead projection

Overhead expenses will include the following:

Description	Per month	Per year
	R	R
Rent	200.00	2,400.00
Gas	300.00	3,600.00
Insurance	100.00	1,200.00
Marketing	100.00	1,200.00
Salaries and wages	1,000.00	12,000.00
Transportation	200.00	2,400.00
General maintenance	100.00	1,200.00
Spares	50.00	600.00
Unforseen expenses	100.00	1,200.00
Administration	50.00	600.00
Loan instalment	2,663.90	31,966.80
Total	4,863.90	58,366.80

The generic model will calculate each expense item according to local costs.

2.5.3 Income statement

This indicates the required breakeven turnover in terms of units in the second row and in terms of monetary value in the third row:

Description	Per month	Per year
	R	R
Price per loaf of bread	3.80	3.80
Required breakeven (units)	4,413.70	52,964.43
Required breakeven (R)	16,772.07	201,264.83
Sales	19,988.00	239,856.00
Gross profit	5,796.52	69,558.24
Gross profit %	29.0%	29.0%
Overhead expenses	4,863.90	58,366.80
Funds generated	932.62	11,191.44

Note that the income statement excludes the once-off start-up costs in order to indicate a typical monthly and first-year scenario. The start-up costs are however included in the projected cash flow.

The generic model will enter the following 3 items only:

- Average price per unit
- Sales per month
- Overhead expenses per month

2.5.4 Cash flow

A monthly cash flow projection is attached, Annexure A.

2.5.5 Capital required

The capital required can be divided into 3 categories, namely:

- Start-up costs
  Include all the initial, non-recurring costs excluding the fittings and equipment listed below. This will typically include:

Description	R
Lease agreement	100
Shipping	10000
Opening promotion	1000
Unforseen costs	500
Total	11600

- Fittings & equipment
  This is listed under para. 6.1 and is estimated at R84 187-00

- Working capital
  This requirement includes initial stock, overhead expenses and unforeseen expenses:

Description	R
Initial stock	1,000.00
Overhead expenses for 1 month	3,750.00
Unforseen expenses	500.00
Total	5,250.00

The generic model needs to:

- Calculate and enter start-up costs according to country specific cost structures
- Establish the price of fittings and equipment
- Regarding working capital, enter overhead expenses for 1 month

2.5.6 Sources of funding

Total capital required and the sources of funding are as follows:

Description	Total	Own funds	Loan
	R	R	R
Start-up costs	11,600.00	5,000.00	6,600.00
Fittings & equipment	84,187.00	-	84,187.00
Working capital	5,250.00	330.02	4,919.98
Total	101,037.00	5,330.02	95,706.98
Contribution	100.0%	5.3%	94.7%

The generic model follows these steps:

- Enter the total of each category
- Enter the amount available from the entrepreneur

  Note: Some entrepreneurs will be able to contribute the full amount of the required investment. The aim is for the entrepreneur to contribute as much as possible. A general rule of thumb is at least 20% of the investment, although this is not always possible. The amount of R5 330.02 used above as own contribution is an arbitrary figure merely to illustrate a possible real-life scenario.

2.5.7 Financial

The entrepreneur will require financial assistance in the amount of R106 206-98 by way of a term loan over 36 months at an interest rate of 15%. This will result in a monthly instalment of R2663-90

The generic model can now:

- Determine the size of the loan required
- Determine the applicable interest rate
- Calculate the monthly instalment

2.6 Technical plan

2.6.1 List of equipment required

Description		Price
		R
1 x	Solar bakery	84000.00
1 x	broom	10.00
1 x	chair	119.00
2 x	plastic containers	58.00
Total		84187.00

3 Business Plan: Integrated mini-grid

Description of businesses

3.1 Core activities

The productive use mini-grid is a stand-alone power generation system that provides 220V AC power. This integrated mini-grid acts as a business opportunity platform upon which a range of downstream businesses are developed. While the concept is generic in that a range of different business opportunities – from different sectors – might be considered, the model discussed below is centred on the promotion of commercial farming. With agriculture at the centre, a number of off-farm support businesses have been added. These offer a range of value adding services to agricultural products that will assist in accessing broader market opportunities. While agriculture remains the primary commercial thrust, addition commercial opportunities are developed around parallel market opportunities.

3.2 Location

The optimal conditions for the implementation of the productive use mini-grid are rural areas with high-density settlement patterns. Settlement patterns should be of a village or clustered nature, as opposed to dispersed, and the ideal village should consist of in excess of 100 households. Additional considerations include low prospects for grid electrification, reliable water source, evidence of commercial activity and proximity/access to potential markets.

Commercial farming is key to the success of the mini-grid. It is intended that the mini-grid will provide sufficient impetus to encourage small scale farmers to lift their activities to a commercial level while other non-farmers will be encouraged to take up farming.

3.3 Mapping the scenario

As suggested the key profit centre for the mini-grid is commercial farming. Choice of technologies and downstream businesses reflect this central reliance on commercial farming. Indeed, this illustrates the principle relationship upon which the generic character of the mini-grid is based. The commercial or profit centre will vary - from rural to urban and between sectors - and its character will influence the appropriate technologies and downstream business applications.
The optimal scenario for the agriculture centred mini-grid is as follows:

- For the mini-grid to be feasible there should be at least 100 hectares under plough. Farms will probably average 2 hectares although the size of the farms will not have an impact on the business plan.
- The 100 (1 km²) hectares should fall within a 20 km radius (1257km²) of the host village
- Access to a reliable and sufficient water supply
- Low prospects for electrification

Given the absence of any rural infrastructure in Sub-Saharan Africa, the infrastructure and opportunities that the integrated mini-grid will offer may well appeal to markets beyond these boundaries. The opportunities represented by these additional markets have not been factored into this business plan.

3.4 Ownership structure

The businesses will be owned and operated as a sole proprietor.

3.5 General legal issues

The following legal issues should be considered:

- Ownership structure
- Trading licence or permit
- Income tax, both business and personal
- VAT
- Other country specific taxes, duties and/or levies
- Local or community authority
- Lease agreement
- Power supply agreement
- Trading hours permitted

3.6 Detail of product and service

3.6.1 Detailed description

Power generation and fertiliser business

This business provides power, on a fee for service basis, to a number of rural customers including households, rural institutions and businesses. The cost of the service is determined both by the status of the consumer and the amount of power required. The two business service options represent different power requirements. Additionally, the business sells fertiliser, a by-product of the digestion process, to farmers in the area.

Households: Power supply: 300Wh/day
Appliances: Lights, radio and monochrome TV
Fees: $10 installation, $6/month service fee

Schools: Power supply: 4.3KWh/day
Appliances: Lights, OHP, TV, VCR
Fees: $35 Installation, $10/month service fee

Clinic: Power supply: 2.4KWh/day
Appliances: Lights, vaccine refrigerator, TV and VCR
Fees: $30 installation, $10/month service fee

Business (1) Power supply: 6.1KWh/day
Appliances: Lights, machinery
Fees: $30 installation, $22/month service fee

Business (2) Power supply: 4.3KWh/day
Appliances: Lights, light machinery
Fees: $30 installation, $15/month service fee

Fertiliser is sold to farmers within a 20km radius. The cost of fertiliser is $0.01 per kilogram.

Post harvest processing

This business offers post-harvest processing for local agricultural produce. The processing will vary according to the crops grown. For the purpose of the mini-grid, the crop is a common African staple, maize.

Separating/cleaning: This service will prepare produce either for local markets or for a later grinding process.

Grinding: This service will grind down produce for local consumption or for external markets

Food drying, processing & packaging

Services offered by this business also have an off-farm value adding focus. Services include;

Food drying: Solar driers that will utilise the combined power of the sun and electrical heating will dry and preserve food products both for local consumption and commercial markets. Products include vegetables and fruits.

Processing: Food processing is an important off-farm value adding initiative. A range of products can be processed to appeal to broader markets. In the context of an

agriculturally centred mini-grid, a dairy is selected to illustrate this relationship. The dairy will produce yoghurts/sour milks, flavoured milks and butter.

Packaging: The business offers a range of professional packaging options including sacking, boxing, airtight plastic bags and clear plastic/hard base. These will be used both for preservation and storage as well as accessing external markets.

Frozen foods and butchery

This business is both a butchery and a frozen produce retail outlet. The proprietor purchases chickens from the battery, slaughters them (and freezes) and sells them locally. In addition, the butchery slaughters and cuts-up animals on behalf of local customers for ceremonial occasions and other events. Other frozen or cooled products such as ice and cold drinks are also sold.

Butchery: The proprietor slaughters, packages and freezes local meat sources. In addition, the proprietor slaughters animals for customers.

Cold/frozen products: The proprietor sells products such as cold drinks, ice, and flavoured ice.

Communication & business services

This business offers a range of services to local and broader communities. The objective of the business is to provide 'business' and learning opportunities to the local communities. Services include;

Computer training; training in basic computer programmes and the Internet are offered

Phones: The business provides public phones on a metered call charge

Copying/typing: Services include the copying of documents and, where necessary, copy typing as well.

Faxing: A fax machine is available for local and international faxing of documents. This service is charged at cellular call rates.

Internet: Customers wishing to use the Internet can do so an hourly/half hourly rate

Chicken farm

The business operates a battery chicken farm, selling the chickens both to butcheries and the general public. The farm purchases hatchlings, fattens them through the growth cycle and sells then as whole (live) chicks.

Transport business

The business offers the following service;

Transport: The business will transport produce to identified markets. The business will charge a flat rate/ton/km

3.7 Suppliers

Power generation & fertiliser business

The business's principle supply issue is the dung that forms the raw materials for biogas production. All these requirements will be sourced from the host and neighbouring villages. In order to ensure reliable supplies, the business will incentivise collection, possibly leading to the creation of a separate dung collection/transport business.

Post harvest processing

The motor and fittings will be sourced from a large commercial centre. There are no direct consumables.

Food drying, processing & packaging

Equipment will be sourced from a large commercial centre. Consumables for packaging, such as sacking, plastic, and cardboard, will be sourced from a large commercial centre.

Frozen foods and butchery

The proprietor will source animals and/or chickens from the local villages. Cold drinks and ingredients for flavoured ice can be sourced from a small commercial centre.

Communication & business services

With proper planning, the entrepreneur will be able to buy all his consumables from a single supplier. The primary goods required will include, paper and print cartridges which will be secured from a medium to large commercial centre.

Communications (cellular phones) would have to be sought through suppliers who will be in large commercial centres.

Chicken farm

The supply of hatchlings will link with a large commercial centre. Chicken feed will be bought from local maize or other cereal farmers.

Transport business

Fuel is readily available in small/medium size commercial centres.

3.8 Marketing Plan

3.8.1 Customer description

Power generation & fertiliser business

Two categories of customers exist; electricity consumers and those that purchase fertiliser. Electricity consumers will crosscut different market segments, including schools, clinic, households and businesses. In the case of fertiliser sales, the principle customer base will be the commercial farmers both from the host village and neighbouring villages. In addition to farmers, it

is anticipated that some households will purchase fertiliser as an input for small subsistence gardens.

Post harvest processing

Customers for this business will be commercial farmers whose produce requires some level of processing for sales. On a smaller scale, some subsistence farmers will require a similar set of services for domestic consumption.

Food drying, processing & packaging

Commercial farmers who target external markets will require some form of packaging. The kind of packaging will vary according to the produce and the markets targeted. Sacking will be required for domestic storage. Food drying services will appeal both to commercial farmers who target relevant markets as well as domestic or subsistence markets for the purpose of food preservation.

Frozen foods and butchery

The market for frozen food stuffs will be largely domestic, with households from the host and neighbouring villages purchasing the goods. Other products such as ice, cold drinks and flavoured ice are more likely to appeal to local consumers.

Communication & business services

This business will attract customers from both the host and neighbouring villages. Customer profiles will vary for specific services. It is anticipated that business services such as faxing, copying and typing will be required for both young and middle aged adults, while accessing the internet will appeal more to the younger generations. The phone service will attract young adult and adults alike.

Chicken farm

Three customer profiles exist, members of the general public, commercial butcheries and other food retail outlets across the broader radius market.

Transport business

The principle customer will be commercial farmers who require markets and the transportation of goods to these markets. Other ad hoc requirements might emerge, from time to time, from other non-agricultural sectors.

3.8.2 Customer potential, expenditure and pricing

Power generation & fertiliser business

The prices for electricity services will be fixed on a fee for service basis. Each consumer category will pay a different rate. It is envisaged that 100 ($6/month) households will apply for the service, 2 schools ($10 month), one clinic ($10/month) and 6 businesses ($15/$22/month).

140 000 litres of fertiliser will be sold/month to local and neighbouring farmers. With an area of 100 hectors under plough, this would mean approximately 0.1L/m2/month. Farmers will pay $0.01/kg while domestic users will pay $0.04/kg. If small commercial farms are in the region of 2-3 hectors, this will entail 30-50 farmers. The household customer base would be between 80-120 households

Post harvest processing

The 100 hectors under plough within a 20 km radius would produce in the region of 250 tons of maize/year (1 hector = 2.5 tons). If the business secured 40% of the yield for processing this would ensure sufficient market share. The business would charge $0.02/kg for separating and $0.04/kg for grinding. In addition, small scale/subsistence farmers – number between 200-500 would also require these services. These small customers have not been factored into the financial analysis of the business, offering some flexibility in the market penetration requirements on the commercial level.

Food drying, processing & packaging

The 30-50 commercial farmers from the host and neighbouring villages would require a small portion of their produce to be dried. They would be charged $0.02/kg. The bulk of the market will be small scale/subsistence producers who require this service for the preservation of foodstuffs. The potential market would represent all subsistence households (800-1000). Rates for small scale/subsistence farmers would be $0.02/kg.

Packaging market would rely primarily on commercial farmers who are accesing commercial markets. Average packaging profits (from a range of options) would be $0.03/kg. Market penetration of 30% of commercial produce and 5% of subsistence households has been assumed.

The dairy will sell flavoured milk (50 units pm @ net profit of $0.15/unit) butter (100 units pm @ net profit of $0.15/unit) and yoghurt/sour milk (50 units pm @ net profit of $0.10/unit). The market will be the host village's 100 households as well as the passing trade generated from the operation of other businesses (200-500 households – 20%-50% of extended household market).

Frozen foods and butchery

This business would benefit from the custom of both the host and neighbouring villages. If the host business consists of 100+ households and included is the passing trade households, the market source is between 200-500 households. From this it is estimated that the business will sell 350 units (portions) of frozen chicken per month (net profit = $0.65/unit), fifty units of ice (net profit = $0.25/unit), fifty flavoured ice (net profit = $0.04/unit), fifty litres of cold drinks (net profit = $0.15/unit).

In addition, the business will slaughter and prepare five (5) animals (Cows, sheep and goats) a month for customers from the expanded village market. The business will charge $2 for slaughter and cutting.

Communication & business services

This business will appeal to customers from both the host and neighbouring villages (20km radius - 1000+ households). The business plan has assumed that 15% of the 1000 households will require computer training each year and that each course consists of an average of 4 lessons. This means the business will have 13 customers each month for 4 lessons giving a total of approx 50 lessons per month (net profit = $0.60/lesson).

One and ½ percent (1.5%) of the 1000 household market will require telephone services each day. The unit charge is $0.15 and each call lasts an average of 3 units. This will result in a total of 1350 units per month from the three phones combined. Net profit per unit is $0.11. A further income stream is the copier. Thirty-five percent of the households will require copying services each year. This translates into 30 households per month. The average number of copied is estimated at 4 per customer, resulting in the copying of approximately 120 units/month. The net profit per unit is $0.06.

Ten percent (10%) of households will require faxing services each year. This translates into eight households per month. Each customer will fax an average of 2 pages. The net profit per page (unit) is $0.19. Thirty percent of households will use the internet. This translates into 25 customers per month. Customers are charged $0.8 per unit (½ hour). The net profit per unit is $0.66. Of the 1000 households 10% p.a. will require typing services. This represents 8 customers a month. Each visit will average three units (pages). The net profit per unit is &0.07.

Chicken farm

The business will benefit from the host village developing a more pronounced commercial status. While the residents of the host village will be the obvious market, the commercial pull and consumer traffic generated by the mini-grid and downstream market will increase this 'local market' quite significantly. In addition, the business will appeal to retailers and other small businesses in neighbouring villages.

The business plan is premised on the following. Unit sales to the public will be 500 per month. Selling price will be $1 for a (mature) live chicken. Chickens sold to other retailers and butcheries will be $0.85 per bird. Net profit in the case of the general public will be $0.83 while for retailers and butcheries it will be $0.72 per bird.

Transport business

The business will represent all commercial farmers both in transporting the goods to the market. It is assumed that the transport business will offer the service to all villages within a 20 radius. The calculations have worked on the transportation of 10 tones/month. The rate charged for transport is $30/ton. In terms of net profit, the business will make approximately $6/tone of goods. The distance per ton is assumed to be 200km.

3.8.3 Competition

With the mini-grid targeting unelectrified areas, the competition for applications that require 220V AC power will be limited. There will be some competition on the retail level, particularly soft drinks and chickens, but the commercial focus of downstream applications and the customer base which will respond will ensure increased opportunities for local businesses.

3.8.4 Marketing actions

The implementation and opening of the mini-grid will serve as a forceful advertiser. Each business will, however have to market their own products and services in an effort to expand markets well beyond the host village. The establishment of the mini-grid would require extensive consultations over large areas. The consultations would draw attention to a project of this nature.

3.9 Operations plan

This section provides a generic profile of the ideal entrepreneurial candidate

3.9.1 Entrepreneur

Power generation & fertiliser business

The typical entrepreneur will have the following profile:

- Male between the ages of 30-40 years
- A successful businessman
- Basic understanding of power and generators
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard
- High propensity to save

Post harvest processing

The typical entrepreneur will have the following profile:

- Male or female between the ages of 30-40 years
- Business experience
- Experience in post-harvest processing
- Basic understanding of power and generators
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard

Food drying, processing & packaging

The typical entrepreneur will have the following profile:

- Male or female between the ages of 30-45 years
- Business experience
- Knowledge of food drying & packaging processes
- Knowledge of dairy processes an advantage
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard

Frozen foods and butchery

The typical entrepreneur will have the following profile:

- Male or female between the ages of 30-60 years
- General (or retail) business experience
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard

Communication & business services

The typical entrepreneur will have the following profile:

- Could be male or female
- Aged between 30 and 45
- A member of the local community
- Completely computer literate
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard
- High propensity to save

Chicken farm

The typical entrepreneur will have the following profile:

- Male or female between the ages of 30-50 years
- Knowledge of commercial chicken farming, including hygiene.
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard

Transport business

The typical entrepreneur will have the following profile:

- Male or female between the ages of 30-40 years
- Transport business experience
- Knowledge of agricultural markets
- Literate
- Of good standing in the community
- Understanding of customer relations
- Teachable in terms of basic business principles
- People orientated person
- Willingness to work hard

3.9.2 Key functions

Under each business there are a number of key functioned that should be well and continuously performed.

Power generation & fertiliser business

- *Marketing and customer interaction*: entrepreneur will have to market the service effectively and ensure that customers understand the contract, understand the limits and optimal use of the power supply and are satisfied with the service
- *Revenue management*: The entrepreneur must manage revenue collection very closely. Low profit margins coupled with fairly high overheads leave little room for inconsistent revenue flows.
- *Maintenance*: The capital costs of the generation and storage equipment is expensive and therefore requires appropriate maintenance.

Post harvest processing

- *Unit measurement*: The entrepreneur will have to develop a quick and reliable method for weighing goods to be processed
- *Marketing*: The entrepreneur will have to market the service widely, beyond the host village, to villages within a reasonable radius. The mechanisation of this process will encourage a shift to more commercial farming resulting in a greater customer base.
- *Diversification*: depending on the range of crops grown, the entrepreneur will have to diversify his/her services to meet the different processing requirements of the market.

Food drying, processing & packaging

- *Knew technology and materials*: The entrepreneur will have to investigate new technologies and materials than might improve the business and its profitability. The solar market is a dynamic one with many organisations involved.
- *Processing options*: The entrepreneur should investigate different food processing ideas as these might lead to new business opportunities and income streams.
- *Unit control*: Close control over weights and units will have to be exerted to ensure no revenue losses.

Frozen foods and butchery

- *Marketing:* The entrepreneur should ensure that she advertises beyond the local village market. There will be opportunities, given the lack of refrigeration/freezing where electricity is absent
- *Book keeping;* Given the range of products and high volume, low turnover character of much of these products, strict controls will have to be maintained over stock and sales.

Communication & business services

- *Purchasing, Pricing and Stock control*: The entrepreneur would need to implement a system of timeous purchasing in order to avoid out-of-stock situations. A checklist indicating the minimum stock level for each product will be set up. The main stock that is required includes:
    - Consumables for business service including ink and paper
    - Other stationary items that are stocked
- *Marketing:* Due to the fact that the services being offered are not readily available in the region pro-active marketing will need to be undertaken so as to grow and cultivate the market for the services.
- *Cash control*: The absence of any staff will make this function easily controllable. Cash is reconciled on a daily basis to account for all revenue and expenditure. This is then recorded in a cashbook, which will be summarized on a monthly basis. The monthly summaries will reflect the amount of profit realized.

Chicken farm

- *Marketing:* This kind of farming is fairly high turnover, low margins so it is important that the entrepreneur constantly seeks to expand the market within a reasonable range.
- *Maintenance & preparations:* The entrepreneur's income is entirely dependent on the well being of the chickens. Diseases are a constant threat and all battery farming procedures will have to be followed closely.

Transport business

- *Marketing:* The entrepreneur's services should be available to customers in a wide area. S/he will have to ensure constant contact with existing and potential customers to grow the business

- *The markets:* The entrepreneur will have to establish links with agricultural market structures within the host country. Up to 50% of the businesses income will be derived from identify successful market opportunities for local produce.

3.10 Financial plan

3.10.1 Sales projection

Power generation & fertiliser business

Electricity sales	**monthly fee**	**No of hhs**	**Monthly revenue**	**Annual revenue**
Households	$6.00	100	$600	$7,200.00
School	$10.00	2	$20	$240.00
Clinic	$10.00	1	$10	$120.00
Businesses (low power)	$15.00	2	$30	$360.00
Businesses (higher power)	$22.00	3	$66	$792.00
Monthly revenue			$726	$8,712.00
Fertiliser sales	**Kgs/month**	**$/kg**	**Monthly revenue**	**Annual revenue**
Fertiliser	139,219	$0.01	$1,392	$16,706.25
TOTAL			$2,118	**$25,418.25**

Post harvest processing

Sales Category	**$/kg**	**Kg/month**	**Monthly revenue**	**Annual Revenue**
Griding	$0.04	8,333	$333.33	$4,000.00
Separating	$0.02	8,333	$166.67	$2,000.00
TOTAL			**$500.00**	**$6,000.00**

Food drying, processing & packaging

Sales category	**$/Unit profit**	**Units/month**	**Monthly Revenue**	**Annual Revenue**
Drying	$0.02	781	$15.63	$187.50
packaging	$0.03	6,458	$193.75	$2,325.00
Dairy	-	-	-	
Flav. Milk	$0.15	50	$7.50	$90.00
Butter	$0.15	100	$15.00	$180.00
Yoghurt/sour milk	$0.10	50	$5.00	$60.00
TOTAL			**$236.88**	**$2,842.50**

Frozen foods and butchery

Sales category	**$/unit**	**Unit/month**	**Monthly Revenue**	**Annual Revenue**
Frozen meat	$0.65	350	$227.50	$2,730.00
Ice	$0.25	50	$12.50	$150.00
Flavoured ice	$0.04	50	$2.00	$24.00
Cold drinks	$0.15	50	$7.50	$90.00
Slaughter	$2.00	5	$10.00	$120.00
TOTAL			**$259.50**	**$3,114.00**

Communication & business services

Sales category	$/unit	Unit/month	Monthly Revenue	Annual Revenue
Computer training	$0.70	50	$35.00	$420.00
Phones	$0.15	1350	$202.50	$2,430.00
Copying	$0.09	117	$10.50	$126.00
Faxing	$0.22	17	$3.67	$44.00
Internet	$0.80	25	$20.00	$240.00
Typing	$0.10	25	$2.50	$30.00
TOTAL			**$274.17**	**$3,290.00**

Chicken farm

Sales category	$/unit	Unit/month	Monthly Revenue	Annual Revenue
Sale of live chickens to public	$1.00	500	$500.00	$6,000.00
Sale of live chickens to retailers	$0.85	150	$127.50	$1,530.00
Sale of chickens to butcheries	$0.85	150	$127.50	$1,530.00
TOTAL			**$755.00**	**$9,060.00**

Transport business

Sales category	$/ton	Tons/month	Monthly Revenue	Annual Revenue
transport	$30.00	10	$312.50	$3,750.00
TOTAL			**$312.50**	**$3,750.00**

3.10.2 Overhead projection

Power generation & fertiliser business

Description	p.a.	p.m
Digester maintenance 2%	$400.00	$33.33
Animal waste purchase	$1,971.00	$164.25
Technician	$800.00	$66.67
Genset replacement	$3,000.00	$250.00
Battery replacement	$2,773.00	$231.08
Loan installment	$12,400.44	$1,033.37
TOTAL	**$21,344.44**	**$1,778.70**

Post harvest processing

Description	p.a.	p.m.
Machine replacement	$500.00	$41.67
Shaft replacement	$50.00	$4.17
Electricity costs	$264.00	$22.00
Loan Installment	$3,377.00	$281.42
TOTAL	**$814.00**	**$67.83**

Food drying, processing & packaging

Description	p.a.	p.m.
Drying system	$125.00	$10.42
Packing equipment	$71.43	$5.95
Electricity costs	$264.00	$22.00
Packing materials	$28.96	$20.00
Loan installment	$1,169.67	$97.47
TOTAL	**$1,659.05**	**$155.84**

Frozen foods and butchery

Description	p.a.	p.m.
Electricity	$264.00	$22.00
Packaging	$210.00	$17.50
Stock purchase (cold drinks)	$300.00	$25.00
Stock purchase (Flavour)	$6.00	$0.50
Loan installment	$746.67	$62.22
TOTAL	**$1,526.67**	**$127.22**

Communication & business services

Description	Per year	Per month
Consumables	$57.00	$4.75
Call charges	$91.50	$7.63
Electricity	$180.00	$15.00
Assistant	$480.00	$40.00
Technical repairs	$207.50	$17.29
Loan installment	$830.25	$69.19
Totals	**$1,016.00**	**$153.85**

Chicken farm

Description	Per year	Per month
Loan	$810.00	$67.50
Electricity	$264.00	$22.00
Hatchlings	$1,920.00	$160.00
Vehicle maintenance/fuel	$504.00	$42.00
Feed	$1,600.00	$133.33
Cleaning	$240.00	$20.00
Total	**$5,338.00**	**$444.83**

Transport business

Description	Per year	Per month
Fuel	$2,083.33	$173.61
Maintenance	$210.00	$17.50
Totals	**$2,293.33**	**$191.11**

3.10.3 Income statement

Power generation & fertiliser business

Annual revenue	$25,418.25
Annual expenditure	$21,344.44
Net profit (p.a.)	$4,073.81
Net profit (p.m.)	$339.48

Post harvest processing

Annual income	$6,000.00
Annual expenditure	$4,191.00
Annual profit	$1,809.00
Monthly income	$150.75

Food drying, processing & packaging

Annual Income	$2,222.50
Annual expenditure	$1,633.22
Annual profit	$589.28
Monthly income	$49.11

Frozen foods and butchery

Annual income	$3,120.00
Annual expenditure	$1,526.67
Annual profit	$1,593.33
Monthly income	$132.78

Communication & business services

Annual income	$3,290.00
Annual expenditure	$2,524.25
Annual profit	$765.75
Monthly income	$63.81

Chicken farm

Annual income	$9,060.00
Annual expenditure	$5,338.00
Annual profit	$3,722.00
Monthly income	$310.17

Transport business

Annual income	$3,750.00
Annual expenditure	$2,293.33
Net annual profit	$1,456.67
Net monthly income	$121.39

3.10.4 Start-up costs

Start-up costs include initial working capital. These funds are to ensure the smooth opening of the business and enable the business to sustain itself for a month before having to rely on income generated.

Power generation & fertiliser business

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$502.08
Unforseen expenses	$100.00
Total	**$647.08**

Post harvest processing

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$349.25
Unforseen expenses	$100.00
Total	**$494.25**

Food drying, processing & packaging

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$175.88
Unforseen expenses	$100.00
Total	**$320.88**

Frozen foods and butchery

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$127.22
Unforseen expenses	$100.00
Total	**$272.22**

Communication & business services

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$141.17
Unforseen expenses	$100.00
Total	**$286.17**

Chicken farm

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$444.83
Unforseen expenses	$100.00
Total	**$589.83**

Transport business

Capital required	
Marketing	$30.00
Opening	$15.00
Overhead expenses (1 month)	$191.11
Unforseen expenses	$120.00
Total	**$356.11**

3.10.5 Capital required

The breakdown of these figures are listed under 6.1 List of equipment required. The totals are as follows.

Power generation & fertiliser business

Total capital required: $63,592.00

Post harvest processing

Total capital required: $3,300.00

Food drying, processing & packaging

Total capital required: $2,900.00

Frozen foods and butchery

Total capital required: $1,750.00

Communication & business services

Total capital required: $3,750.00

Chicken farm

Total capital required: $3,000.00

Transport business

Total capital required: $0.00

3.10.6 Sources of funding/financial assistance

Power generation & fertiliser business

Description	Total	Own funds	Loan
Start-up costs	$647.08	$647.08	$0.00
Equipment & fittings	$63,592.00	$0.00	$63,592.00
Total	$64,239.08	$647.08	$63,592.00
Contribution	100%	1.01%	98.99%

Post harvest processing

Description	Total	Own funds	Loan
Start-up costs	$494.25	$494.25	$0.00
Equipment & fittings	$3,377.00	$0.00	$3,377.00
Total	**$3,871.25**	**$494.25**	**$3,377.00**
Contribution	100%	12.77%	87.23%

Food drying, processing & packaging

Description	Total	Own funds	Loan
Start-up costs	$320.88	$320.88	$0.00
Equipment & fittings	$2,900.00	$0.00	$2,900.00
Total	**$3,220.88**	**$320.88**	**$2,900.00**
Contribution	100%	9.96%	90.04%

Frozen foods and butchery

Description	Total	Own funds	Loan
Start-up costs	$272.22	$272.22	$0.00
Equipment & fittings	$1,750.00	$0.00	$1,750.00
Total	**$2,022.22**	**$272.22**	**$1,750.00**
Contribution	100%	13.46%	86.54%

Communication & business services

Description	Total	Own funds	Loan
Start-up costs	$286.17	$286.17	$0.00
Equipment & fittings	$3,075.00	$0.00	$3,075.00
Total	**$3,361.17**	**$286.17**	**$3,075.00**
Contribution	100%	8.51%	91.49%

Chicken farm

Description	Total	Own funds	Loan
Start-up costs	$589.83	$589.83	$0.00
Equipment & fittings	$3,000.00	$0.00	$3,000.00
Total	**$3,589.83**	**$589.83**	**$3,000.00**
Contribution	100%	16.43%	83.57%

Transport business

Description	Total	Own funds	Loan
Start-up costs	$356.11	$356.11	$0.00
Equipment & fittings	$0.00	$0.00	$0.00
Total	**$356.11**	**$356.11**	**$0.00**
Contribution	100%	100.00%	0.00%

3.11 Technical plan

3.11.1 List of equipment required

Power generation & fertiliser business

Description	Qnt	Amount	Total
Digester	1	$20,000.00	$20,000.00
Genset	1	$12,000.00	$12,000.00
transmission	100	$180.00	$18,000.00
Inverter	1	$1,500.00	$1,500.00
Batteries	1	$11,092.00	$11,092.00
Slurry lagoon	1	$1,000.00	$1,000.00
TOTAL			**$63,592.00**

Post harvest processing

Description	Qnt	Amount	Total
Motor	1	$2,000.00	$2,000.00
Shaft(s)	2	$150.00	$300.00
Premises	1	$1,000.00	$1,000.00
TOTAL			**$3,300.00**

Food drying, processing & packaging

Description	Qnt	Amount	Total
Drying system	1	$500.00	$500.00
Packing equip	1	$500.00	$500.00
Dairy	1	$1,500.00	$1,500.00
Premises	1	$400.00	$400.00
TOTAL			**$2,900.00**

Frozen foods and butchery

Description	Qnt	Amount	Total
Freezer	1	$750.00	$750.00
Butchery	1	$1,000.00	$1,000.00
TOTAL			**$1,750.00**

Communication & business services

Description	Qnt	Amount	Total
Computer	2	$600.00	**$1,200.00**
Phones	3	$25.00	**$75.00**
Facsimile	1	$300.00	**$300.00**
Printer/copier	1	$500.00	**$500.00**
Premises	1	$1,000.00	**$1,000.00**
TOTAL			**$3,075.00**

Chicken farm

Description	Qnt	Amount	Total
Battery equipment	1	$1,500.00	**$1,500.00**
Small heater	1	$300.00	**$300.00**
Premises	1	$1,200.00	**$1,200.00**
TOTAL			**$3,000.00**

Transport and marketing business

This business requires no additional equipment as it is assumed that the selected entrepreneur has his/her own vehicle.

3.11.2 Energy requirement

Power generation customers

While the business itself does not consume electricity – rather it generates electricity through biogas – it is appropriate to profile non-commercial customers under this heading.

Households

item	rating (W)	quantity	hours	Wh/day	KWh/day
light	7	4	2	56	0.056
radio	10	1	5	50	0.05
TV	25	1	4	100	0.1
Total Wh/household				206	0.206
Total for households		100		**20600**	**20.6**

Schools

item	rating	quantity	hours	Wh/day	KWh/day
light	9	10	6	540	0.54
overhead	300	1	2	600	0.6
TV	80	1	3	240	0.24
VCR	35	1	2	70	0.07
Total per school				**1450**	**1.45**
Total for schools		2		**2900**	**2.9**

Clinics

item	rating	quantity	hours	Wh/day	KWh/day
Ambient light	15	10	8	1200	1.2
Special purpose lig	100	1	1	100	0.1
radio	10	1	6	60	0.06
refrigerator	70	1	12	840	0.84
TV and VCR for he	120	1	1.5	180	0.18
Total for clinic		1		**2380**	**2.38**

3.11.3 Downstream businesses

The model does not develop its power requirements on the basis of actual businesses. To enable the mini-grid to represent a generic model, two power consumption categories have been determined, high power consumption and medium power consumption. A scenario has been developed for each category. It is estimated, on the basis of the range of PU options associated with an agriculturally centred mini-grid that 4 businesses will fall within the high power category while the remaining two will fall within the medium power category.

High power

item	rating	quantity	hours	Wh/day	KWh/day
Ambient light	7	2	8	112	0.112
Machine	2000	1	4	8000	8
Total per business				**8112**	**8.112**
Total for businesses		4		**32448**	**32.448**

Medium power

item	rating	quantity	hours	Wh/day	KWh/day
Ambient light	7	2	8	112	0.112
Apparatus	1000	1	4	4000	4
Total per business				**4112**	**4.112**
Total for businesses		2		**8224**	**8.224**

Energy supply

The energy supply for the mini-grid will be a biogas run generator. The biogas will be processed in a biogas digester with a capacity of 60m3. The process will be fuelled by animal waste. The biogas with be cleaned and used to run a 20 Kw generator. The peak demand was determined at approximately 16 Kw. The generator will produce 220V AC current enabling the operating of high power applications.

Appendix B

Funding options for the dissemination of PU business models

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1 Sources of Finance

1.1 International Development Finance Institutions and Renewable Energy Funding Sources

1.1.1 ADB/AfDB – African Development Bank Group

Introduction

The African Development Bank Group consists of three financial institutions: The African Development Bank (ADB), the African Development Fund (ADF) and the Nigeria Trust Fund (NTF). The Bank Group is a multinational development bank supported by 77 member countries from Africa, North and South America, Europe and Asia. Its main focus is the economic development and social progress of its Regional Member Countries.

The African Development Bank (ADB) provides non-concessional funding at higher interest rates and shorter repayment terms for wealthier African countries. Concessional funding or 'soft loans' are made to the poorer countries through the African Development Fund (ADF) and entail longer repayment periods and minimal service charges. The Nigeria Trust Fund (NTF) extends loans to African countries on terms situated between those of the African Development Bank (ADB) and the African Development Fund (ADF). The non-concessional loans of the ADB bear variable interest rates which reflect the Bank's favourable borrowing costs due to its AAA status. The Bank also has the Private Sector Unit (PSU) to promote commercial projects. It works in Units of Account (UA) equivalent to the IMF's Special Drawing Rights (SDR) and one UA is worth about US$ 1,30.

History

It was established in 1963 when the agreement establishing the African Development Bank was adopted in the Sudan and came into force the following year with Organisation of African Unity states as members. The ADB began operations in 1966. In 1982, membership was opened to non-African countries and 25 non-regionals such as India and Brazil joined.

The Bank Group's cumulative loan and grant approvals from 1967 to 1999 amounted to US$36,279.51 million spread across 2,327 projects. Bank Group approvals in 1999 stood at US$ 1,695.62 million. ADB approvals amounted to US$ 1,065.48 million with the balance of US$630.14 million coming from the ADF window.

Focus

Regional

On a regional level, the countries in North Africa accounted for 32.7% of ADB loans, followed by West Africa with 25.2%, Southern Africa with 14.2%, East Africa with 14.2% and Central Africa with 13.2%.

Sector
African Development Bank Group operations emphasize programs and projects in the social and agricultural sectors because of their immediate impact on poverty reduction. Approvals in these two sectors accounted for 36% of total Bank loan and grant approvals during 1999. Approvals in the agricultural sector focus on improving productivity and household food security with approvals in the social sector focusing principally on education and health.

Other areas of strategic thrust include project quality, environmental protection and private sector promotion.

Cumulative approvals were for projects and programs in agriculture (23.3%), public utilities (20.4%), transport (16.3%), industry (15.8%), multisector (14.2%) and the social sector (10%).

Terms and Conditions
The Bank lends at a variable-lending rate calculated on the basis of the cost of borrowings. The rate is adjusted twice a year, on January 1st and July 1st, to reflect changes in the average cost of borrowings over the preceding six-month period. The other terms include a commitment charge of 1%, maturities of up to 20 years, including a 5-year grace period.

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1.1.2 AEF - Africa Enterprise Fund

Introduction
The Africa Enterprise Fund was established by the International Finance Corporation (IFC) of the World Bank Group in 1989 to assist small and medium-sized enterprises in sub-Saharan Africa.

History
Since its creation, the AEF has provided a total of US$206 million for 309 projects in 30 African countries. During 1999, AEF funding amounted to US$31.14 million across 39 projects in 16 countries.

Focus
Regional
The regional focus is on sub-Saharan Africa. In general, projects are identified, appraised, and supervised by IFC staff based in Abidjan, Accra, Douala, Harare, Johannesburg, Lagos, and Nairobi. Most of the time, AEF works closely with the

local investment partner, usually a bank, finance house, or development agency with a strong local presence.

Sector
On a sectoral level, cumulative approvals were for projects and programs in tourism (11%), agribusinesses (37%), financial sector (6%), manufacturing (28%) and services (18%)

Terms and Conditions
It supports investment in commercial projects with total capital costs ranging from the equivalent of US$ 250 000 to US$ 5 million. It provides up to 40% of project financing mainly in the form of loans and equity capital and its investments are made on commercial terms. AEF financing ranges between US$100,000 and US$1,5 million. Only projects in IFC member countries are eligible for financing of which Namibia has been a member since 1990. Projects must also have the potential to earn a satisfactory financial return while benefiting the economy of the host country.

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1.1.3 ETEF – Empowerment through Energy Fund

Introduction
The ETEF is a South Africa-based fund which have emerged out of a partnership between Absa, IDC, Shell Foundation and RAPS Finance which collectively established the R51 million Fund. This partnership between major financial institutions and energy sector role players provides a unique opportunity to overcome the financial and technical barriers faced by SME's in the energy sector.

To further strengthen the partnership, Shell SA will function as an industry partner, making available industry and management expertise to the fund manager and to entrepreneurs.

Focus
The mission of the ETEF is to invest capital, skills and knowledge in viable SME's in the modern energy industry. This mission is based on the recognition that:

- Provision of modern energy services to un-served households, businesses and communities is a condition to the advancement of social, economic and environmental well being and to enhancing the livelihoods of the poor.
- If provided the proper mix of services and capital, small and medium sized energy enterprises can accelerate the delivery of pro-poor modern energy services in a sustainable manner.
- Creation of small and medium sized energy enterprises can make a contribution to the achievement of Black Economic Empowerment.

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1.1.4 AFD - Agence Française de Développement

Introduction

The AFD is a public institution and the main instrument of the French Government co-operation policy in charge of financing development aid. The AFD is present in over 80 countries in Africa, the Pacific, the Caribbean, Asia and the French Overseas Departments and Territories. The AFD also provides the secretariat for the French Global Environment Facility (FGEF) and is a contributor to the International Monetary Fund's enhanced structural adjustment facility.

History

During 1999, the AFD committed a total of € 1.4 billion of which € 973.8 million was committed to developing countries and € 420.1 million to Overseas France. The € 973.8 million committed to developing countries was divided between the AFD and PROPARCO project aid (€ 682.7 million), PROPARCO guarantees (€ 175.8 million), structural adjustment funding through AFD subsidies and loans (€ 94.5 million) and equity investments through PROPARCO (€ 20.8 million).

Focus

Regions

During 1999, commitments in sub-Saharan Africa reached € 396.2 million, of which € 230.4 million (58.3%) went to countries in the franc zone, reflecting the AFD's commitment to its traditional partners.

Sectors

AFD works largely with **governments** and the **public sector** in funding infrastructure, urban and agriculture development, and providing technical assistance and training.

Projects are financed across a number of sectors. Urban infrastructure (26%), rural development (24%) Banking (17%) and Energy (10%) were the sectors to receive the majority of project aid in 1999.

Terms and Conditions

In terms of AFD's strategic objectives, projects should address issues of poverty reduction and improvements in a communities' standard of living by developing infrastructure and promoting employment through the creation and expansion of enterprises, while at the same time respecting the environment.

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1.1.5 BADEA - Arab Bank for Economic Development in Africa

Introduction

The **Arab Bank for Economic Development in Africa** was established in 1975 as an initiative of the members of Arab League countries to strengthen economic, financial and technical ties between Arab countries and member states of the Organisation of African Unity (OAU). It also promotes such co-operation between North Africa and the rest of the continent. This is achieved through the funding of development programmes and projects in Africa, through the stimulation of contributions of Arab capital to African development and through the provision of technical assistance. The projects and programmes are largely co-financed with the Islamic Development Bank as well as the World Bank and others. Recently **BADEA** has introduced a new trade finance programme which finances Arab-African trade. An amount of US$50 million (extendable to US$100 million) has been earmarked for this purpose.

History

BADEA's cumulative total commitments to non-Arab African countries amounts to US $ 2298.1 million dollars, for financing 284 projects, 239 technical assistance operations, 15 line of credits, 14 emergency aid operations and 59 operations from the Special Arab Aid Fund for Africa.
Under the current five-year plan (2000 – 2004) total financing allocated amounts to US$ 675 million including project loans and technical assistance. Commitments for the first year of the plan is US$ 125 Million, an amount which increases annually by US$ 5 Million for the remaining four years of the plan.

Focus

Region
BADEA's operations in Africa cover 43 eligible countries in sub-Saharan Africa.

Sector

The operations cover infrastructure, agriculture, rural development, rural water and electricity, rural roads, animal and fish production, energy, industry, social development and the banking sector.

Terms and Conditions
BADEA's contribution to the financing of any given project cannot exceed 50% of the total cost of the project and the amount of financing should not exceed US$ 15 million. For smaller projects where the total project costs does not exceed US$12 million, BADEA will finance up to 80% of the total project cost. BADEA undertakes its financing activities within the framework of a five-year plan which takes into account the available resources, the Banks objectives and the needs of beneficiary countries.

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1.1.6 COFIDES - Compania Espanola de Financiacion del Desarrollo

Introduction

Compania Espanola de Financiacion del Desarrollo is Spain's national development bank which is a member of the European Development Finance Institutions (EDFI). It was established to foster direct investments by Spanish companies in developing economies. COFIDES provides the following services:

- Advice on suitable financial mechanisms for private investments.
- Mobilisation of funds from various sources for the undertaking of feasibility studies, training and technical and management assistance.
- Provision of finance for investments through minority and temporary share capital holding or medium to long term ordinary or equity loans.
- Provision of institutional support to projects in which it is involved.
- Mobilisation of funds from various multilateral and national financial institutions for projects in which it is involved.

Since 1999, COFIDES has also been designated as the manager for the Fund for Foreign Investments (FIEX) and the Fund for Small and Medium-Sized Enterprise Foreign Investment Operations (FONPYME).

History

Since 1990, when COFIDES first began operating, the company has assumed commitments of funds to finance operations for a total of 17,200 million pesetas. At

the end of 1999, 146 such operations with a total value of 9,294 million pesetas had been formalised. This funding was allocated to 116 investment projects implemented in 32 countries. During 1999, COFIDES approved 26 new projects in 9 countries with a value of 3,260 million pesetas (US$ 19.7 million). The sums committed by COFIDES for projects approved in 1999 vary from 25 to 377 million pesetas (US$150,000 to US$ 2,3 million), an average of 125 million pesetas (US$ 750,000) per project. COFIDES current portfolio includes 83 projects in 26 countries. Its total net commitment is 5,954 million pesetas (US$ 35.9 million).

Focus

Region

The principal target markets are Latin America (Chile, Peru, Uruguay, Argentina, Mexico, Brazil and Colombia), India, Kenya, Mozambique, Ghana and South Africa.

Sector

The major industries applying for FIEX support are transportation infrastructure, including toll roads, railways and airports, electricity generation, gas distribution and the iron and steel industry.

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1.1.7 DBSA - Development Bank of Southern Africa

Introduction

The Development Bank of Southern Africa (DBSA) was established in 1983 to address the socio-economic imbalances and improve the quality of life of the peoples of South and southern Africa.

Its mandate is threefold:

- to invest in infrastructure and facilitate the provision of infrastructural development finance;
- to finance sustainable development in partnership with the public and private sectors; and
- to respond to development demands and act as a catalyst for investment.

DBSA works with a number of partners including the wider donor community to promote development goals. DBSA will mobilize additional co-financing when required, promote public private partnerships for infrastructure development, provide technical assistance at a policy and capacity building level and provide professional and administrative resources for managing special infrastructure development initiatives. In the 1999/2000 financial year, co-financing activities more than doubled the project value of the DBSA's contribution.

History

At the end of the 1999/2000 financial year DBSA's cumulative loan and equity approvals for investment support totaled R21,1 billion. Of this 34% was invested in municipal infrastructure, 52% in bulk and connector infrastructure, 9% in entrepreneurial support and 5% in social and institutional infrastructure. Cumulative guarantees totaled R275 million. Cumulative grant approvals for technical support totaled of R51,7 million. Of this 51% was for institutional capacity building and 39% for policy and planning.

Focus

Region

DBSA's regional focus is South Africa and the Southern African Development Community. Currently, DBSA is involved in a number of projects in southern Africa. DBSA's contribution to these projects totals R2,3 billion out of a total project cost of

R4,2 billion. The countries where they are involved in projects are Mauritius (44.9%), Namibia (29.9%), Swaziland (13.2%), Zambia (11.1% and Malawi (0.8%).

Sector

Sectorally, DBSA's emphasis is on the development of regional infrastructure (water, power, transport and telecommunications and information technology), municipal infrastructure (reticulation and municipal facilities), rural infrastructure (water schemes, community-related infrastructure, communication systems and input depots and distribution points), social infrastructure (clinics, health centres, hospitals and education facilities), eco-tourism infrastructure, enterprise infrastructure (physical infrastructure, markets and technology transfer facilities) and institutional infrastructure.

Loans per sector for 1999/2000 included, Entrepreneur development 1%, Telecommunications 1%, Energy 17%, Sanitation 3%, Education 2%, Roads & drainage 11% Multiple & social services 30% Water 35%. Examples of projects supported in Namibia to date include;

- Namibian Development corporation to support its SMME clients
- Urban infrastructure in the form of water and sanitation
- Transport infrastructure
- Electricity infrastructure, the upgrading and extension of the distribution network
- Sold waste infrastructure, the development of a new sold waste dumping site

The allocation of loans institutionally were as follows; Educational institutions 2%, Public utilities 20%, Development finance institutions 1%, National government 16%, Local government 38% and the Private sector 23%.

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1.1.8 DEG - German Investment and Development Company

Introduction

The German Investment and Development Company (Deutsche Investitions-und Entwicklungsgesellschaft mbH) provides funding and consultancy services to promote growth in Africa, Asia, Latin America, Central and Eastern Europe through private sector development. It focuses on partnerships in these regions with German and European firms. It operates along private enterprise lines and only co-finances projects that are profitable, environmentally sound and make effective contributions to host country development.

DEG offers custom-made finance and consultancy packages to companies on commercial terms. They will provide support at every phase of a project through to successful implementation of the business plan. DEG will also make arrangements for additional finance including parallel financing from international institutions such as the International Finance Corporation (IFC), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB). Finance from programmes run by the German government can also be accessed. DEG and GTZ jointly promote the activities of German enterprises in developing countries as part of their Public-Private Partnership Programme (PPP). With the PPP, the Federal Ministry for Economic Cooperation and Development (BMZ) supports joint projects of German enterprises (private partner) and development cooperation organizations (public partner).

History

At the end of 1999, DEG's project portfolio totalled DM 3,998 million. At the end of 1999, 20% (DM 799.6 million) of these commitments were in Africa. DEG views southern Africa as a future growth region presenting interesting investment opportunities specifically in the areas of mining, agriculture, manufacturing, infrastructure, energy and tourism. Currently DEG has 50 projects in southern Africa with a value of some DM400 million.

Focus

Region

These commitments were spread across 451 companies in 87 countries. The total investment of these project enterprises amounted to DM 33.3 billion. The average project size was DM 11 million, with financial commitments ranging from DM 0.3 million to DM 39 million.

Sector

On a sectoral basis, DEG places emphasis on the financial sector, agriculture and infrastructure. Their principal sectors of involvement are Manufacturing 36% Infrastructure 9% Agriculture 6%, Other 8%, Financial, Institutions 41%. Target enterprises are those planning or making a substantial and sustainable investment in developing countries.

Terms and Conditions

Generally the implementing organizations, DEG and GTZ, can provide up to DM 400,000 per project in development funding from federal funds for projects with a positive development policy impact. DEG is also involved in the BMZ business startup programme, under which DEG can offer advice, long-term loans and equity grants to foreign specialists who have acquired professional experience or completed training in Germany to set up their own business abroad.

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1.1.9 DFID - Department for International Development

Introduction

The Overseas Development Administration is the British government department responsible for promoting development and for the reduction of poverty. The government's policy on international development has as a central focus a commitment to the internationally agreed target to halve the proportion of people living in extreme poverty by the year 2015, together with associated targets of basic health care and access to primary education. DFID is responsible for taking this policy forward and manages Britain's aid to about 150 developing countries with an aid programme which is one of the largest in the world.

History

For the 1999/2000 financial year, DFID's budget was £2,240 million of which £1,272 was bilateral aid. Africa receives 45% of all DFID bilateral funds, some £499 million in 1999/2000.

DFID launched a Business Linkages Challenge Fund (BLCF), a £17 million fund managed by Deloitte and Touche to support partnerships between enterprises in developing countries and domestic or international businesses with the aim of encouraging private investment into developing countries.

Focus

Region

Seven African countries feature in DFID's list of top ten recipient counties during 1999/2000. They are, in order of importance, Uganda, Tanzania, Ghana, Malawi, Mozambique, Sierra Leone and South Africa. Aid is made available on the basis of project finance, finance for essential materials and equipment, technical assistance and training, support for research and emergency aid for refugees. In January 2001,

DFID has a regional office located in Pretoria which administers the aid programme for Southern Africa (South Africa, Botswana, Lesotho, Namibia and Swaziland).

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1.1.10 FMO - Netherlands Development Finance Company

Introduction

The FMO's core activity consists of providing long-term financing in the form of loans and equity. FMO finances companies unable to do so without outside assistance. FMO cushions their risks with large funds and reserves and its special status as bilateral development bank. This status is partly founded on the support of the Dutch government, which owns 51% of the FMO's shares and makes an annual contribution to the bank's own funds. The bulk of the remaining shares are held by the main Dutch banks, the two largest trade unions and about 120 companies and private persons.

FMO targets the expansion of private enterprise in emerging markets and plays an active role in syndicated loans. For these loans FMO acts as loan provider, while other financial institutions participate under FMO supervision.

History

FMO's financing portfolio is spread across 71 countries with total assets amounting to 1.3 billion EURO

Focus

Region

FMO provides financing for companies located in emerging markets. FMO clients by region in 1999 were Asia 26% Africa 26% Europe 20% Latin America 28%. The FMO seeks to place 70% of its financing in low and lower-middle income countries. Special attention is given to Sub-Sahara Africa.

Sector

FMO invests in a wide range of sectors. In 1998 the primary sectors in Africa were Mining (24%) the Food Industry (20%) and Energy (15.7%)

Terms and Conditions

A principle policy is that the financing must have a catalysing effect, thus activating or mobilising capital from third parties. At least 25% of a total syndicated loan is for the FMO's account. The average loan is around EUR 4.85m. The FMO also participates in the share capital of companies in emerging markets, although this is always as a minority shareholder. In general the participation covers an average term of five years. FMO also participates in private equity funds. There are a number of other mechanisms that FMO has to disburse funds including those aimed at SMME's (with assets of up to US$100 000), a seed capital programme for start-up finance as well as financing for technical co-operation.

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1.1.11 GTZ - Deutsche Gesellschaft für Technische Zusammenarbeit

Introduction

The Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) was founded in 1975 when the Federal Agency for Economic Co-operation and the German Corporation for Technical Assistance to Developing Countries merged. It supports the Government of the Federal Republic of Germany in achieving its development policy objectives and is responsible for Germany's technical co-operation programmes with counterpart organisations in Africa, Asia, Central and South America and Eastern Europe.

It is a non-profit limited-liability company under German law and belongs wholly to the German Government. Its principle client is the German Federal Ministry for Co-operation and Development (BMZ), which defines objectives for projects and lays down the financial framework for these activities in the form of specific commissions while other ministries avail themselves of its services too. With the consent of Government, the GTZ also undertakes commissions for third parties, particularly international organisations and foreign governments. This is known as Reimbursable Technical Co-operation. GTZ plans, services and implements German contributions to the projects of partner countries, selects local and seconded experts, provides training and procures material and equipment.

The GTZ is one of the world's largest service enterprises in the field of development co-operation. With its Headquarters at Eschborn near Frankfurt am Main, and numerous local offices in partner countries, more than 10 000 staff members are employed in 122 developing countries.

History

In 1996, the GTZ received new commissions worth US$ 1,1 billion, with US$ 1,02 billion thereof coming from public sector clients. It assists development and reform processes in partner countries by promoting projects and programmes which currently number some 2 750. In 1998 commitments rose to DM1.6bn and remained the same in 1999. African countries account for roughly 30% of funding each year.

Since 1990 GTZ has supported technical cooperation projects in the Republic of Namibia. Project funding by the GTZ in 2000 amounted to DM 12.9 million,

Focus

Region

GTZ works worldwide in the field of development cooperation. It has 10,000 employees working worldwide in over 120 countries. It has its own offices in nearly 70 countries. The four regional departments within the organization are Sub-Saharan Africa, Asia, Latin America and Mediterranean Region, Europe, Central Asian Countries.

Sector
GTZ allocation by sector in 1999 was as follows, Consultancy Aid 2%, Other public benefits 5%, Food and Security 2%, Business Co-operation 2%, Grants to experts 5%, Food and Refugee Aid 7%, Other 1%, Agricultural Research 2%,Bilateral Technical Co-operation 74%

Private Sector Commitments in 1999 were as follows, Materials, Equipment and Food 18%, Labour and materials 1%, consultants and appraisers 81%

General German support in Namibia focuses on the following areas:

- Infrastructure (Water supply, road construction, telecommunication, harbor development)
- Resource Management (including Fisheries, Sustainable Agriculture, Environmental Management, Alternative sources of Energy)
- Private Sector Development
- Institution and Capacity Building
- Education and Health.

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1.1.12 IDA - International Development Association

Introduction

The International Development Association (IDA) of the World Bank was established in 1960 to provide assistance to poorer developing countries on terms that would bear less heavily on their balance of payments than IBRD loans. Funds lent by IDA are derived mainly from contributions by its richer members, as well as transfers from IBRD net earnings.

History

In 1998 Africa accounted for 41% of IDA disbursements and took 38% of its lending commitments. During that year IDA and IBRD lending to African borrowers totalled US$2 873,8 million of which most was IDA lending (US$ 2 816,4 million). The IDA lending shows an increase from a figure of US$1 680,7 million registered for 1997.

Focus

Region

There are 80 IDA-eligible countries with GNP per capita of less than US$ 925 (in 1997 terms). 41 of those countries are African, 2 of which also qualify for IBRD lending - Nigeria and Zimbabwe.

Representatives of thirty-nine donor countries to the IDA of the World Bank have reached agreement on new funding for least developed countries. IDA can make concessional loans to these countries totaling US$ 20,5 billion between 1 July 1999 and 30 June 2002. The new contributions amount to US$ 11,6 billion.

Sector

Sectoral allocations for 1998 for IDA lending were: public sector management (US$ 155,1 million), transport (US$ 770,1 million), multisector (US$ 404,9 million), agriculture (US$176,9 million), social sector (US$ 114,7 million), urban development (US$ 85 million), population, health and nutrition (US$ 227 million), education (US$ 372,3 million), electric power and other energy (US$ 380,3 million), water supply and sanitation (US$ 110,7 million), environment (US$ 71,8 million), and mining (US$ 5 million). These allocations elate to total of 65 operations approved in 1998.

For the year 2000 IDA lending by sector was as follows; Finance and Private Sector Development 8%, Public Sector Management 8%, Human Development 38% Economic Policy 10% Agriculture and Environment 12%, Urban Development 8% Infrastructure 13%, Other 8%

Terms and Conditions

These credits (also called ‘soft loans’) carry no interest, but require an annual service charge of 0,75% on the undisbursed amount of each credit. There is a commitment charge of between 0 - 0,5% of the undisbursed balance. They have to be repaid over a period of 35-40 years with a ten-year grace period before repayment begins.

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1.1.13 IFC - International Finance Corporation

Introduction

The International Finance Corporation was established in 1956 as the 'private sector arm' of the World Bank Group. It has US$ 4,2 billion in net worth and, with the involvement of some 160 countries, is the world's largest source of direct project financing for private investment in developing countries. It does not compete with, or replace, private initiative and capital but helps raise finance for commercial projects which would otherwise have been held back because of inadequate capital or, sometimes, adverse political conditions in the country concerned. It plays a major role in mobilising capital in the international financial markets.

Terms and Conditions

Its instruments are equity and loans (or a mixture of the two), technical assistance and special development funds. Investments are normally between US$ 1 million and US$ 50 million, with the IFC usually not taking more than 25% participation.

History

In 1996, the IFC's total committed project portfolio for Africa was US$ 1,161 million. In 1995, some 24% of all approved IFC and AEF projects were carried out in sub-Saharan Africa. For the period 1997-1998 the IFC engaged in 226 projects compared to 203 in 1996-7 involving global commitment of US$ 5,1 billion with US$ 2,7 billion for its own account and 2,4 billion for the account of participating institutions.

Focus

Sector

Since 1956, its portfolio has been in capital markets and financial services (about 17%), mining (14%), agribusiness (10%), construction and cement (8%), general manufacturing and industry (7%), chemicals and related products (7%), energy (6%), textiles (5%) tourism and services (4%), and timber, pulp and paper (4%).

For the period 1997- 1998 the disbursement by sector was

Disbursement by sector was financial services (US$ 1 454 million); infrastructure (1 237); petrol, gas and mines (806); chemicals and petrochemicals (436), agro-industry (366); manufacturing industries (356); wood and paper (148); and diverse (337). In the case of technical assistance, the IFC was involved in 18 countries in the sub-Saharan.

Sectoral Distribution of IFC approvals in Sub-Saharan Africa during the year 2000 was as follows; Financial Services 48%, Infrastructure 14%, Oil gas and Mining 35%, Food and Agribusiness 1%, Other 2%

Region

In sub-Saharan Africa, 81 projects in 23 countries were approved for a value of US$ 679 million. US$ 559 million was disbursed on 54 projects. Country allocations for approved projects were: South Africa (11 projects including 2 hospitals, a charcoal producing company, interventions in the financial sector and the manufacturing and service industries); Angola (detergents); Burkina Faso (transport and banking); Cameroon (hydrocarbons and soap); Côte d'Ivoire (8: petroleum, gas, flour milling,

power station, toll road and bridge); Gambia (school); Ghana (coffee plantation, services); Guinea (mines, schools, hotel); Guinea-Bissau (banks and insurance); Kenya (horticulture, health, handling and cereals); Madagascar (banks and clothing); Malawi (finance and housing); Mali (bag manufacture); Mozambique (banking and metal plate manufacturing unit); Namibia (fishing); Nigeria (services, gas supply, infrastructure); Uganda (7: apartment construction, rose production); Rwanda (rose production); Senegal (5: power station, schooling, tannery, fishing and phosphates); Seychelles (banking); Tanzania (5: finance, insurance, bottling, fruit juice production and telecommunications); Zambia (cotton processing, drilling, insurance, precious stone sorting); Zimbabwe (5: maternity, banking, dairy processing, tourism).
region.

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1.1.14 Kuwait Fund - Kuwait Fund for Arab Economic Development

Introduction

The Kuwait Fund for Arab Economic Development was established in 1961 as the agency of the State of Kuwait responsible for the provision and administration of financial and technical assistance to developing countries in their efforts towards economic development. Since March 1981, the authorised capital of the bank has been KD 2 billion.

The principal functions of the Kuwait Fund are as follows:

- the extension of loans, guarantees, and grants-in-aid,
- the provision of technical assistance services, participation in the capital of development institutions and eligible corporations,
- representation of the Government of the State of Kuwait in regional and international organisations.

History

Since its inception until the end of 2000, the Fund has made total loan commitments of KD 3,075 million, constituting 592 loans to 96 countries.

Focus

Region

Under its initial mandate, operations were limited to Arab countries. However, since 1974 the funds activities have been extended to include any developing country

Sector

Eligible recipients for assistance include:

- central governments, local authorities, public utilities, and other public bodies,
- development institutions, whether international, regional or national, and especially development finance organisations.
- mixed enterprises and private corporations whose activities have a development impact and which are not exclusively geared to profit making.

There are no sectoral limitations on activities, although the fund is active principally in agriculture and irrigation, transport and storage, power and industry as is illustrated by the following breakdown of previous funding, Energy 21% Industry 15% Water & sewage 11% Other 2% Agriculture 17% Transport & communications 34%.

Terms and Conditions
Assistance is provided through a number of means including direct loans or guarantees, participation in joint or parallel financing arrangements with other donors, grants in aid to finance techno-economic studies, advisory services, participation in equity capital of corporations and through contributions to the resources of development institutions including the African Development Bank and the International Development association.

The Fund does not finance more than 50% of the total cost of any project or programme.

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1.1.15 SIDA - Swedish International Development Co-operation Agency

Introduction

The Swedish International Development Co-operation Agency (SIDA) was created in July 1995 after the merger of SIDA (Swedish International Development Authority) with BITS (technology), SAREC (research), SWEDECORP (private sector promotion), and Sando Course Centre.

The overall goal of Swedish development cooperation is to raise the standard of living of poorer groups of people in the world. The Swedish Parliament has adopted the following six specific objectives in order to achieve this overall goal:

- Economic growth
- Economic and political independence

- Economic and social equality
- Democratic development in society
- The long term, sustainable management of natural resources and the protection of the environment
- Equality between men and women

History

In 2000 SIDA supported approximately 4 636 projects in developing countries. SIDA Funding to 47 African Countries in the year 2000, amounted to a total of US$397,763. Funding to Southern Africa constituted 31% of this amount.

Focus

Region

Main African recipients were Tanzania, Mozambique, South Africa, Uganda, Namibia, Ethiopia, Zambia, Angola, Zimbabwe, Rwanda, Kenya, Democratic Republic Congo, Ghana, Eritrea, Malawi, Somalia, Burundi, and Guinea-Bissau

Sector

Departments are divided into Infrastructure and Economic Cooperation (energy, telecommunications, transport, urban development, development and co-operation credits, etc), Natural Resources and the Environment (agriculture, forestry, fisheries, rural development, etc), Research Cooperation, Cooperation with NGOs and Humanitarian Assistance, Finance and Corporate Development, Personnel and Organisation Development, Evaluations and Internal Audit, Information, Democracy and Social Development as well as the Director General, Board of Directors and Regional Departments for Africa, Asia, Latin America and Central and Eastern Europe.

Disbursement levels in Namibia for the year 2000 amounted to a total of US$21,055 million. The sectoral breakdowns of the disbursements were as follows, Human rights and democratic governance (5%), Social sectors (29%), Infrastructure, trade & industry and urban development (63%), Natural resources (2%), and others (1%).

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1.1.16 UNDP - United Nations Development Programme

Introduction

The United Nations Development Programme is the world's largest multilateral grant development assistance organisation, which serves over 170 countries and territories through a network of offices in some 130 countries. It was created in 1966 by way of a merger of the Expanded Programme for Technical Assistance (EPTA) and the United Nations Special Fund. It is a member organ of the United Nations. Its funds are derived from voluntary contributions from most of the world's nations. It is the main co-coordinating body for many of the UN agencies and is especially involved in technical assistance programmes and projects related to matters such as poverty alleviation, environment, natural resources, technology transfer, management development, etc. It is also paying increasing attention to private enterprise promotion and, together with the *International Finance Corporation (IFC)* and the *African Development Bank (AfDB),* established the *Africa Project Development Facility (APDF)* which assists small and medium-sized entrepreneurs in Africa.

History

Funding to Africa in 1998 amounted to a total of US$ 199.9 million. Total funding to Namibia in 1998 amounted US$ 0.8 million.

Focus

Region

The UNDP has offices in 45 countries in Sub-Saharan Africa to which it provides policy advice and knowledge-based services to government and other partners as part of its global effort to help halve the world's poverty rate by 2015.

Sector

The aim is to accelerate the continents progress by ensuring that both globalilsation and digital technology focus on the imperative to reduce poverty and promote human development. UNDP believes that information and communications technology can help expand Africa's participation in the global economy. It is thus committed to bridging the digital divide.

UNDP strongly supports its country offices of their own development. This involves building critical capacities at all levels and promoting participatory decision making. In partnerships with other development agencies, civil society, private sector and NGO's, UNDP strives for greater cooperation and assists government in mobilizing resources.

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1.1.17 USAID - United States Agency for International Development

Introduction

The United States Agency for International Development is the US government agency responsible for development assistance in Africa and in developing countries elsewhere. It is an independent agency with field missions abroad. USAID staff work with local communities in Africa, Asia, the Near East, Latin America, the Caribbean, Central and Eastern Europe, and the newly independent states of the former Soviet Union. USAID contracts with more than 3500 US firms and over 300 US-based private voluntary organisations.

History

Requested funding for USAID's Development Assistance Fund for the 1999 financial year amounts to almost US$ 1billion. This amount includes US$ 730 million in development assistance funding for FY 1999 programming in Africa, US$ 67 million in Economic Support Funds, and US$ 128 million for the International Disaster Assistance Fund.

Focus

Region

USAID supports the *Southern Africa Enterprise Development Fund (SAED*F) which functions independently in administering a US$ 100 million USAID grant for commercial projects in southern Africa. Fifty percent of these funds are allocated to South Africa for support to business initiatives.

In 2001 total Development Assistance to Africa amounts to US$793,881,000

Sector

The five main areas in which it works are promotion of economic growth, the advancement of democracy, delivery of humanitarian assistance to victims of famine and other natural and man-made disasters, support of family planning, health services and protection of the environment.

USAID funding by sector in 1998 was as follows, Democracy 5% Education and Training 9% Population & Health 16% Environment 6% Humanitarian Assistance 5% Economic Growth 59%.

Sectoral funding to Africa in 2001 was as follows:

- Encouraging Broad-Based Economic Growth and Agriculture US$ 796,864,000
- Strengthening Democracy and Good Governance US$ 55,956,000
- Building Human Capacity through Education and Training US$ 94,264,000
- Protecting the Environment US$ 86,482,000
- Promoting Family Planning and Protecting Health US$ 360,315,000

Total Funding in Namibia for the year 2000 amounted to US$9300,000. The sectoral distribution of the funds were Economic Growth and Agriculture 43%, Environment 21%, Human Capacity Development 23% and Democracy 11%

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1.1.18 EIB - European Investment Bank

Introduction

The European Investment Bank was set up in 1958 by the Treaty of Rome which established the European Economic Community (EEC). It is the European Community's financial institution and its capital is owned by EC member states.

A new development partnership between the EU and the ACP is in the offing, with the groundwork having been laid at the Cotonou Convention in 2000. The new partnership will run for 20 years and shift focus from risk capital to investment facilities, intended to develop commercially viable enterprises, chiefly in the private sector. The EIB is responsible for the management of this new instrument, to which EUR 2200m has been allocated for the first five years.

Concurrently, the Bank will be able to mount operations drawing on its own resources up to an aggregate amount of EUR 1 700 million..

History

The EIB made loans totalling US$ 575 million to African, Caribbean and Pacific countries during 1998. Industrial development took 43% of the total.

Focus

Region

Although it has operated mainly in the European Community, its activities have extended to the African, Caribbean and Pacific (ACP) countries.

Sector

On a Sectoral basis loans made to the ACP countries during 1998 were as follows, Industrial development took 43% of the total. Support for energy sector projects accounted for 42% and included large-scale power projects in Ethiopia, Madagascar, Namibia and Zambia. EIB funding also went to water treatment (10%) and communications infrastructure (5%). Eastern Europe has been the largest non-EU beneficiary followed by the Middle East and North Africa and thereafter the ACP countries.

The EIB places considerable emphasis on environment issues and has its own Environment Unit.

Terms and Conditions

Assistance takes the form of loans, grant aid and risk capital with the last-mentioned targeted at the private sector. As a AAA-rated institution, the Bank uses a number of instruments including risk capital for equity, performance shares, conditional loans, lines of credit and global loans through the **EI**B's approximately 130 partner banks.

The Bank will provide up to 50% of the total project cost and there is thus considerable emphasis on co-financing. It will stay in a project for up to twenty years. It does however require guarantors. Project approvals from the Board normally take about three months.

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1.1.19 JICA - Japan International Cooperation Agency

Introduction

The Japan International Cooperation Agency was established in 1974 to help implement the Japanese Government's Official Development Assistance (ODA). It is responsible for the implementation of Japan's technical assistance for developing countries.

Aid from Europe and the United States has failed to grow significantly since the end of the Cold War; African countries have increasingly been looking to Japan for assistance. In light of the importance of this region in terms of international politics, Japan organized the 1st Tokyo International Conference on African Development (TICAD) in 1993 and the second TICAD in 1998. The aim of these conferences was to stress the importance of African development to the international community and to enhance understanding and support for the region. On the basis of the guidelines for Japanese aid to Africa presented at these conferences, JICA determined that the ultimate goal of African development should be the eradication of poverty, and we are now striving to make improvements in personnel training and the capacity to formulate and implement policy in connection with the following fields:

(1) Support in fields of social development centering on education, health and medical care, and water supply.
(2) Support for agricultural development with consideration given to the food security of the poorer sectors of society.

(3) Support for development and strengthening of market economy institutions that contribute to development of the private sector.
(4) Support for democratization as the basis of development, prevention of conflict, and post-conflict recovery.
(5) Support contributing to better debt management capacity. Provision of cooperation in these areas will involve a sectoral program approach based on intra-regional cooperation centering on South-South cooperation* and regional bases, making use of the development experience of Asia and collaboration with donors* in line with conditions in specific countries.

History

According to official Japanese documentation, in 1996, the total amount of Japan's ODA was US$ 9,44 billion and Japan has retained its position as the world's no. 1 donor of ODA for six years in a row, in which technical co-operation to the developing world totalled US$ 3,13 billion.

In fiscal 1999 JICA provided cooperation to 43 countries in Africa, a figure representing all the countries in the region with the exceptions of Somalia, Burundi, the Democratic Republic of the Congo, and Liberia. Cooperation with African countries accounted for around 14% of the total value of JICA's technical cooperation.

The same sources state that in South Africa grant aid administered by JICA has reached over US$ 7,3 million. Trainees have been invited to Japan for training in areas such as small and medium-size enterprise development, agriculture, electrical works, housing construction, welding techniques, regional development management, local public health, education administration and police administration

Focus

Sector

Its main activities are training programmes, technical cooperation, expert dispatch programme, development study programme, dispatch of Japan Overseas Co-operation Volunteers, administration of grant aid programmes, emergency disaster relief services and equipment provision.

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1.1.20 KFW - Kreditanstalt für Wiederaufbau

Introduction

KFW (Kreditanstalt für Wiederaufbau) was founded in 1948 with domicile in Frankfurt am Main. It focuses its lending on both the German economy and as a development bank for developing countries. Its capital is held 80% by the Federal Republic and 20% by the Federal Länder. With a balance-sheet total of approx. 197 billion Euros it is one of Germany's largest banks.

On behalf of the German Government KfW finances investments and project-related advisory services to expand economic and social infrastructure as well as trade and industry, and measures to protect the environment and natural resources in developing countries.
KfW appraises the projects for their eligibility, advises the partner countries in their implementation, and evaluates the success of the projects after they are completed.

History

Some 26 African countries received funding from KfW in 1999. In 1999 Namibia ranked 30th in terms of overall recipients of aid and received 14.01 million Euros

Focus

Sector

KfW's primary focus is on small and medium-sized enterprises, which form the backbone of the German economy. It finances investments of these enterprises in Germany and abroad. A particular concern is the financing of innovations and venture capital. Other important sectors are housing, infrastructure and environmental protection.

KFW's Commitments by Sector in 1999 were as follows, Multi-sectoral operations 6%, Commodity Aid and Structural Aid 5%, Financial Sector 12% Production and Trade 5%, Social Infrastructure 25%, Economic Infrastructure 47%

Terms and Conditions

It allocates loans and grants mainly through government institutions for infrastructure projects and development programmes, training and manpower assistance as well as financial assistance for the procurement of approved goods and services.

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1.1.21 NORAD - Norwegian Agency for Development Cooperation

Introduction

The Norwegian Agency for Development Cooperation (NORAD) administrates long-term government-to-government development co-operation with close to 20 countries in Africa, Asia and Central America. This is conducted through the Norwegian embassies and enables NORAD to prioritise areas for development co-operation.

The main goal of Norwegian development co-operation is to contribute towards lasting improvements in the economic, social and political conditions under which people live in developing countries, with special emphasis on assistance which benefits the poorest sector of the community.

NORAD's activities are based on the following five main goals of Norwegian development cooperation:

- To combat poverty and contribute towards lasting improvements in living standards and quality of life, thereby promoting greater social and economic development and justice nationally, regionally and globally. In such development, priority must be given to employment, health and education.
- To contribute towards promoting peace, democracy and human rights.
- To promote responsible management and utilisation of the global environment and biological diversity.
- To contribute towards preventing hardship and alleviating distress arising from conflicts and natural disasters.
- To contribute towards promoting equal rights and opportunities for women and men in all areas of society.

Focus

Region

NORAD channels a substantial portion of Norwegian development funds through Norwegian partners in 80 developing countries in Africa, Asia, South and Central America, and Europe.

Development assistance by NORAD to Africa has amounted to a total of NOR 1,968,167,000.

Sector

NORAD expenditure by sector in 1999 was as follows, Experts and consultants 0% Installment on loans 0% Industry and commerce 5% Non-government Organisations 13% Research and human development 1% Extended Co-operation 2% Long Term Development 34% Regional Allocation 45%

Terms and Conditions

Norwegian development funds are transferred to the target group direct. Partners in cooperation and beneficiaries of development cooperation are first and foremost the central government and local authorities, civil society, and the business sector. These are responsible for the administration of Norwegian development funds and thus responsibility for development in their own country rests with them. In cooperation with its partners, NORAD works for a development which benefits the poorest members of society.

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1.1.22 OPEC Fund - Organisation of Oil Producing Countries Fund for International Development

Introduction

The OPEC (Organisation of Oil Producing Countries) Fund for International Development is an intergovernmental development finance institution. It was established in January 1976, by the member countries of the Organisation of the Petroleum Exporting Countries (OPEC) following a decision taken in March 1975 by the Sovereigns and Heads of State of OPEC.

The Aims of the OPEC Fund is as follows:

- To promote co-operation between OPEC member countries and other developing countries as an expression of South-South solidarity
- To help particularly the poorer, low-income countries in pursuit of their social and economic advancement.

The Fund strives to fulfill its mandate in several ways:

- Through the extension of loans on concessionary terms for project and program financing and for balance of payments support;
- Through the provision of grants in support of technical assistance, food aid, research and similar activities, and emergency aid;
- Through its recently established Private Sector Facility, under which loan and equity investment terms and conditions are market-based rather than concessional;
- Through financial contributions to other development agencies whose work benefits developing countries.
- As a collective agency of OPEC member countries, the Fund also extends financial support on behalf of these countries as a group, and serves, when deemed appropriate by the member countries and within limits set by the Ministerial Council, as a co-coordinator of multilateral OPEC initiatives in the area of financial cooperation among developing countries.

History

Since its inception, the Fund has implemented 13 lending programs, the last of which covered the period 1998-1999. The Fourteenth Lending Program, approved for a two-year duration, became effective January 1, 2000.
On a cumulative basis and by the end of December 2000, US$4,540.4 million had been committed in the form of loans; and US$2,912.4 million had been disbursed.

Focus

Region

All developing countries benefit from Fund assistance, with the exception of OPEC member countries, are in principle eligible for Fund assistance. The least developed

countries, however, are accorded higher priority. Also eligible for Fund assistance are international institutions whose activities benefit the developing countries.

Total funding for Africa in 1999 by the OPEC fund amounted to US$1465,266 million over a spread of 44 countries.

Sector
OPEC Project Loans to Africa, by Sector, 1999 were as follows, Health 5% Telecommunication 0% Energy 12% Multi-sectoral and other 2% Industry 4% Water Supply & Sewerage 6% Education 15% National Development Banks 7% Transportation 26% Agriculture & agro-industry 23%

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1.1.23 AusAID - Australian Agency for International Development

Introduction

The Australian Government's overseas aid program is managed by the Australian Agency for International Development (AusAID). AusAID's funding is used to implement development projects ranging from small projects in local communities, like digging wells, through to large-scale development projects covering areas like education and health, through to infrastructure development such as telecommunications networks.

There is emphasis on the application of Australia's industrial, agricultural, technological and medical know-how. AusAID also supports non-governmental aid organisations in carrying out development and relief activities. As an important part of the program, development activities are carried out in collaboration with other countries through international and multilateral organisations such as the United Nations, the World Bank and the Asian Development Bank.

The head office is in Canberra and AusAID maintains representatives in 25 Australian diplomatic missions overseas.

History

In the 2000/01aid budget, Australia is to provide A$ 1,6 billion in Overseas Development Assistance.

Focus

Region
Most of Australia's aid program is used to assist the countries of the Asia-Pacific region. Substantial aid is also provided to African countries. During the 2000/2001 financial year, some A$74.0 million has been allocated to the continent. An agreed policy framework for Australian aid to Africa for 1999-2002 has been established.

The geographic focus of Australia' s bilateral aid to the region centres on South Africa and Mozambique with more limited activities in Zimbabwe and other east African countries.

Sector
The new framework has a tighter sector focus, a greater emphasis on partnerships and support for effective policy frameworks of recipient governments. In South Africa the aid program is aimed at developing a new program to improve capacity at local government level. Australia is also providing assistance for South Africa's major reforms in technical and vocational education, and continues to support a gender violence fund. In Mozambique, Australia supports demining programs and is assisting with the recovery from floods in early 2000.

Health, education, infrastructure, rural development and governance are the five priority sectors for Australia's aid program. Expenditure across these sectors was as follows, Rural Development 14% Infrastructure 16% Health 11% Governance 15% Education 18% Other 26%

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1.1.24 CIDA - Canadian International Development Agency

Introduction
The Canadian International Development Agency (CIDA) was established in 1968 as an agency of the Crown. CIDA supports sustainable development activities in order to reduce poverty and to contribute to a more secure, equitable and prosperous world. To support this objective, CIDA focuses its resources on six programme priorities:

- Basic human needs: to support efforts to provide primary health care, basic education, family planning, nutrition, water and sanitation, and shelter.
- Women in development: to support the full participation of women as equal partners in the sustainable development of their societies.
- Infrastructure services: to help developing countries to deliver environmentally-sound infrastructure services, with an emphasis on poorer groups and on capacity building.

- Human rights, democracy, good governance: to increase respect for human rights, including children's rights; to promote democracy and better governance; and to strengthen both civil society and the security of the individual.
- Private sector development: to promote sustained and equitable economic growth by supporting private sector development in developing countries.
- The environment: to help developing countries to protect their environment and to contribute to addressing global and regional environmental issues.

History

CIDA's total gross development assistance budget during 1998/99 was C$1,815.26 million, of which C$ 284 million was earmarked for projects and programmes in Africa.

Focus

Region

Main target countries for operations in Africa include South Africa, Egypt, Ghana, Mali, Senegal, Tanzania, Zambia and Guinea.

Sector

On a sectoral basis, human resource development programmes receive one-third of the ODA allocation followed by economic and financial support accounting for a further 24%. The following illustrates sectoral breakdown of CIDA's development assistance budget for the 1998/99 financial year, Health and Population 13% Energy 6% Economic and Financial Support 24% Human Resource Development 34% Agriculture 13%, Other 4% Industry 6%

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1.2 Global Climate Change Related Funding Sources

1.2.1 Introduction

This section is dealt with a differently than the other sections on Sources of Funding. Firstly the possibility of Global Environmental Fund (GEF) financing is looked at and then a short description of possible sources of finance and other support for the Clean Development Mechanism (CDM) and Carbon Offset Project Development is given. Due to the complexity and new possibilities in the field of CDM and JI financing, the

sources of such finance is also supplemented with a list of possible Environmental and Energy Commodities Brokerage Houses that might assist in accessing this type of funding. The inclusion of climate change funding opportunities is not principally related to the PU models proposed but indicates general funding opportunities for existing and subsequent PU initiatives that meet the climate change criteria.

1.2.2 Global Environment Facility

Introduction

The Global Environment Facility was established to forge international cooperation and finance actions to address four critical threats to the global environment: biodiversity loss, climate change, degradation of international waters, and ozone depletion. Related work to stem the pervasive problem of land degradation is also eligible for GEF funding.

Launched in 1991 as an experimental facility, GEF was restructured after the Earth Summit in Rio de Janeiro to serve the environmental interests of people in all parts of the world. The facility that emerged after restructuring was more strategic, effective, transparent, and participatory. In 1994, 34 nations pledged $2 billion in support of GEF's mission; in 1998, 36 nations pledged $2.75 billion to protect the global environment and promote sustainable development.

The GEF can succeed in its global environmental mission only as part of a worldwide movement toward sustainable development. GEF brings together 166 member governments, leading development institutions, the scientific community, and a wide spectrum of private sector and non-governmental organizations on behalf of a common global environmental agenda.

GEF Funding

The GEF funds projects in four focal areas: biodiversity, climate change, international waters, and ozone. Projects to address land degradation, as it relates to the four focal areas, are also eligible for funding.

Since 1991, the GEF has provided grant financing for 21 off-grid solar photovoltaic (PV) projects in 20 countries. In addition, four more projects are under preparation in the pipeline. Though specific objectives vary, the projects, in general, are aimed at stimulating and achieving commercialization of solar PV systems for rural households (called “solar home systems”). In all, these 20 projects together account for about US$ 210 million of GEF allocation, and about $1.4 billion in total project costs.

Climate change. Projects addressing climate change make up the second largest group of GEF-funded projects. As the financial mechanism for the United Nations Framework Convention on Climate Change (UNFCCC), GEF receives guidance from the COP on policy, program priorities, and eligibility criteria related to the Convention. Climate change projects are designed to reduce the risks of global climate change while providing energy for sustainable development. GEF climate change projects are organized into four areas: 1) removing barriers to energy efficiency and energy conservation; 2) promoting the adoption of renewable energy by removing barriers and reducing implementation costs; 3) reducing the long-term costs of low greenhouse gas emitting energy technologies; and 4) supporting the development of sustainable transport.

From 1991 to 1999, GEF allocated $884 million to 227 climate change projects and enabling activities, which was matched by more than $4.7 billion in co-financing.

GEF Funding Options

Full-size projects. GEF's three implementing agencies, UNDP, UNEP and the World Bank/IFC, work with the operational focal point in each recipient country to develop project ideas that are consistent both with the country's national programs and priorities and with GEF's operational strategy and programs. Regional or global programs and projects may be developed in all countries that endorse the proposed activity. Namibia became a full member of the GEF on 30 April 2001.

Medium-Sized Projects (MSPs). Grants of less than US$1 million are available through expedited procedures that speed processing and implementation. These medium-sized grants increase GEF's flexibility in programming resources and encourage a wider range of interested parties to propose and develop project concepts.

Enabling Activities. Grants for enabling activities help countries to prepare national inventories, strategies, and action plans in cooperation with the Convention on Biological Diversity and the UN Framework Convention on Climate Change. This assistance enables countries to assess biodiversity and climate change challenges from a national perspective, determine the most promising opportunities for project development, and subsequently pursue full-scale projects.

Project Preparation and Development Facility (PDF). Funding for project preparation is available in three categories or "blocks." Block A grants (up to $25,000) fund the very early stages of project or program identification, and are approved through GEF's implementing agencies. Block B grants (up to $350,000) fund information gathering necessary to complete project proposals and provide necessary supporting documentation. These grants are approved by the GEF CEO, with attention to the GEF operations committee's recommendations. Block C grants (up to $1 million) provide additional financing, where required, for larger projects to complete technical design and feasibility work. Block C grants are normally made available after a project proposal is approved by the GEF Council.

Small Grants Program. UNDP administers this project, which offers grants of up to $50,000 to eligible projects.

Small and Medium Enterprise (SME) Program. A partnership with the International Finance Corporation (IFC), a World Bank affiliate, the SME program finances projects that demonstrate a positive environmental impact and have basic financial viability, thus promoting private sector investment opportunities in developing countries.

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1.2.3 The Clean Development Mechanism and Joint Implementation

1.2.3.1 Introduction to CDM and Solar Home Systems

The Clean Development Mechanism (CDM) is an instrument established under the Kyoto Protocol to the United Nations Framework Convention on Climate Change, aimed at achieving sustainable development while contributing to the cost-effective mitigation of climate change.
The CDM allows Parties to the Protocol (industrial countries) to meet part of their reduction commitments abroad - notably in developing countries - where specific greenhouse gas (GHG) abatement costs are lower. Simultaneously, this can allow developing countries to attract investments in clean energy technology and assist them in reaching a sustainable development path. Under the CDM, the GHG emissions that are avoided through the use of clean energy technologies (in comparison to what would have been emitted had polluting energy technologies been adopted) will generate 'certified emission reduction units' (CERs) for the investor. These CERs can then be offset against the investing Party's emission allowance, effectively reducing the emissions reduction measures that need to be implemented domestically.

The CDM should therefore be a suitable vehicle for the implementation of renewable energy projects in developing countries. However, CERs, as the name suggests, require that the amount of avoided emissions needs to be certified. This represents a potential problem for small, distributed energy technologies such as PV solar home systems (SHS), as monitoring of all such systems would be impractical.

To address this problem, and thus pave the way for PV SHSs and other technologies in the current CDM negotiations, a simplified standardized emission value system is proposed. This seems to be the most appropriate approach to use, based on the outcome of a Dutch study using information from existing case studies and factors such as upstream emissions. The study concluded that an abatement potential of 200

kg CO2 per 50 Wp SHS per year is a conservative but safe standard emission reduction value. The case studies show that savings of kerosene for lighting provide the largest contribution to CO2 displacement. In some cases, savings of candles and battery charging also contribute.

A second phase of work and further consultation with stakeholders is under way aimed at refinement of the streamlined processes for SHSs in the CDM. Recommendations arising from this work will be presented at the next round of climate talks.

1.2.3.2 Introduction to Activities Implemented Jointly (AIJ) and Joint Implementation (JI)

Under the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol there is provision for countries to jointly undertake collaborative projects to mitigate greenhouse gas emissions. The Convention provides for collaboration through the Activities Implemented Jointly (AIJ) pilot phase whilst the Protocol has provision for collaboration between Annex I countries through Joint Implementation (JI) and between developed and developing countries through the Clean Development Mechanism (CDM). The rules, guidelines and modalities governing the operation of the CDM and JI are the subject of international UNFCCC negotiation.

A pilot phase for activities implemented jointly (AIJ) was launched under the UN Framework Convention on Climate Change (UNFCCC) in April 1995. Joint implementation (JI) is a new instrument that would allow countries to meet a part of their greenhouse gas reduction obligations by public- or private-sector financing of emission reductions in partner countries. This instrument, which is being tested during the AIJ Pilot Phase, promises to foster cost-effective and enhanced private sector investments in climate protection, thus accelerating the dissemination of innovative technologies to limit greenhouse gas emissions worldwide.

The Objectives of the program are as follows:

- to contribute to reducing greenhouse gas emission
- to assess the potential for and the cost-effectiveness of the AIJ instrument within the framework of Climate policy
- on the basis of AIJ investment projects to contribute to the development of credible methodologies for determining and verifying emissions reductions achieved via AIJ projects
- to implement exemplary AIJ projects that clearly demonstrate real, additional environmental benefits as well as local benefits to the host country
- to promote the transfer of technologies to limit greenhouse gas emissions with a view to encourage private sector investment
- to devise, evaluate and implement potential incentive mechanisms to encourage private sector AIJ transactions.

The list of criteria for national acceptance of an Activity Implemented Jointly (AIJ) is as follows:

- AIJ should be compatible with and supportive of national environment and development priorities and strategies and contribute to cost-effectiveness in achieving global benefits;
- All AIJ under the pilot phase require prior acceptance, approval or endorsement by Governments of Parties participating in these activities;
- AIJ should bring about real, measurable and long-term environmental benefits related to the mitigation of climate change that would not have occurred in the absence of such activities;
- the financing of activities implemented jointly shall be additional to the financial obligations of Parties included in Annex II to the Convention within the framework of the financial mechanism as well as to current official development assistance (ODA).

1.2.4 Sources of Finance for CDM and Carbon Offset Project Development

1.2.4.1 U.K. Climate Change Challenge Fund

Introduction

The UK Climate Change Challenge Fund provides flexible sources of funding to help business and developing countries meet the challenges of climate change. It will help finance projects that will help developing countries and economies in transition to build the capacity they need to combine healthy growth with low emissions of greenhouse gases. £500,000 is allocated to the Fund each year and proposals are considered at regular intervals. May consider funding feasibility studies and training activities.

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1.2.4.2 Swiss AIJ Pilot Program

Introduction

One of the more active AIJ programs, the Swiss program funds carbon offset projects that have obtained approval of the host country government.

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1.2.4.3 Australian International Greenhouse Partnerships Office

The Australian International Greenhouse Partnerships (IGP) Program provides funding opportunities for CDM projects with Australian participation. Over AU $6 million available priority will be given to project proposals that seek funding primarily for additional transaction costs related to greenhouse gas reduction considerations. AusAID, Australia's foreign aid program, may be able to provide additional funding for capacity building and training activities.

Since becoming a party to the United Nations Framework Convention on Climate Change in 1992, Australia has adopted a comprehensive action program to reduce its greenhouse gas emissions. Australia's efforts are part of an international endeavour to address climate change. The adoption of the Kyoto Protocol to the FCCC in December 1997 was an important further step in developing a global response. To achieve the collective objective of reduction in greenhouse gas emissions, individual Annex I countries (developed nations) have been set differentiated targets. Achievement of Australia's target will be a significant challenge. It will require the comprehensive implementation of a $1 billion package of predominantly domestic greenhouse reduction measures and effective use of the flexibility mechanisms adopted by the Kyoto Protocol.

The International Greenhouse Partnerships (IGP) Office has been set up with the Australian Department of Industry Science and Resources to implement the IGP Program and facilitate the establishment of the Clean Development Mechanism (CDM) and Joint Implementation (JI).

International Greenhouse Partnerships is a cooperative effort by Australian industry and government to reduce greenhouse gas emissions through projects overseas.

One of the ways that the Office is pursuing its objectives is to establish pilot projects to gain experience. As there are a wide range of projects, which could potentially lead to real mitigation of greenhouse gas emissions, a portfolio approach has been adopted in supporting collaborative projects via the IGP Program. To date, the 15 AIJ projects which have been established in 9 countries comprise a range of project types including solar, micro-hydro, wind, landfill gas recovery, carbon sequestration, energy efficiency, fugitive gas capture, fuel substitution and rural electrification.

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http://www.isr.gov.au/resources/energy_greenhouse/igp/

1.2.4.4 Netherlands CDM Program/SENTER

Under the Ministry of Economic Affairs, Senter acts as the primary agency for coordinating the Netherland's official climate change project work in developing countries. Senter will also be responsible for coordinating government tenders for investing in CDM projects in the coming years through the ERU-PT program, which has already put out a tender for investing in Joint Implementation projects.

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1.2.4.5 U.S. Initiative on Joint Implementation (USIJI)

USIJI is a pilot program encouraging organizations in the United States and other countries to form partnerships to implement projects that mitigate greenhouse gas emissions and promote sustainable development. The main vehicle of the U.S. government to help facilitate and support the development of AIJ and related carbon offset projects internationally. Over three dozen projects in the energy, waste, agriculture, and forestry sectors have been approved by the USIJI thus far. Some have received funding for feasibility work and other technical assessments.

The following individuals, organizations, and entities are eligible to participate in USIJI:
Foreign partners can include:

- Any country that has signed, ratified, or acceded to the FCCC
- Any citizen or resident alien of a country identified above
- Any company, organization, or entity incorporated under or recognized by the laws of a country identified above, or a group thereof

Any national, provincial, state, or local government entity of a country identified above.

To be included in the USIJI, the Evaluation Panel must find that a project submission:

- Is acceptable to the government of the host country
- Involves specific measures to reduce or sequester greenhouse gas emissions initiated as a result of the U.S. Initiative on Joint Implementation or in reasonable anticipation thereof
- Provides data and methodological information sufficient to establish a baseline of current and future greenhouse gas emissions
- Will reduce or sequester greenhouse gas emissions
- Contains adequate provisions for tracking the greenhouse gas emissions reduced or sequestered resulting from the project, and on a periodic basis, for

modifying such estimates and for comparing actual results with those originally projected
- Contains adequate provisions for external verification of the greenhouse gas emissions reduced or sequestered by the project
- Identifies any associated non-greenhouse gas environmental impacts/benefits
- Provides adequate assurance that greenhouse gas emissions reduced or sequestered over time will not be lost or reversed
- Provides for annual reports to the Evaluation Panel on the emissions reduced or sequestered, and on the share of such emissions attributed to each of the participants, domestic and foreign, pursuant to the terms of voluntary agreements among project participants

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1.2.4.6 Canadian Office of Joint Implementation and CDM

Created by the Climate Change Action Fund, Canada's CDM & JI office was established to enhance Canada's capacity to take advantage of the opportunities offered by the CDM and JI. This includes financial support for activities that reduce GHG emissions globally

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1.2.4.7 Oregon Climate Trust

Introduction
Non-profit organization funded by five major electric utilities in the state of Oregon. Oregon legislation requires new fossil fuel power plants in the state to avoid, sequester, or displace a portion of their carbon dioxide emissions. The Oregon Climate Trust therefore provides funding for commercial carbon offset activities overseas and regularly puts out request for proposals for such investments.

Mission

The Climate Trust's mission is to initiate, encourage, and fund projects and educational activities to reduce the greenhouse gas emissions that will result in the damaging effects of climate change on future generations. The Trust will hold rights to any carbon dioxide or other greenhouse gas reduction credits resulting from projects it funds or implements in trust for the citizens of Oregon.

Origins

The Climate Trust (The Trust) came into existence in July 1997, in the wake of a ground-breaking law enacted that year by the State of Oregon. House Bill 3283 established the first meaningful measure in the United States to control carbon dioxide, the most prevalent of global warming gases. HB 3283 requires new energy facilities built in the state to avoid, sequester, or displace a portion of their previously unregulated carbon dioxide emissions.

A new gas-fired power plant -- the first type of facility for which a specific reduction target was established -- must meet a net emissions rate of 0.675 pounds of CO2 per kilowatt-hour. This is 17% less polluting of carbon dioxide than the least-polluting such plant operating in the United States. A plant developer may choose to meet part or all of its reduction target by paying mitigation funds to a "qualified nonprofit" which in turn must use the funds to carry out projects that avoid, sequester, or displace the carbon dioxide the plant will emit in excess of the required standard. The law defines the characteristics of, but does not establish, a qualified nonprofit. The Trust conforms to the requirements of the law and is recognized as a qualified nonprofit.

Purposes and Program Areas

The first priority of The Trust is to effectively implement power plant carbon dioxide offset projects resulting from the 1997 law. However, the Trust's purposes also include promoting or undertaking projects to prevent or mitigate the emission of greenhouse gases from sources other than the construction of new energy facilities in Oregon. A third focus for the Trust will be an outreach and education program to increase Oregonians' understanding of climate change and their opportunities for preventive action.

Activities to Date

The Trust's activities were originally funded with start-up money donated by five electric utility operators in Oregon. Its principal program activity in 1998 was awarding small grants, from a pool of $30,000, for innovative projects to reduce carbon dioxide emissions. The Trust also partnered with the Oregon Office of Energy to organize a series of community forums on climate change in five communities around the state in 1999.

In April 1999, The Trust received the first payment of $1.2 million in mitigation funds from the Klamath Cogeneration Project, a partnership between the City of Klamath Falls and PacifiCorp. The Trust has chosen five projects that avoid, sequester, or displace the emission of carbon dioxide to the atmosphere. Currently we are completing contracts to acquire these projects.

Guiding Principles

- The Trust will operate consistent with the following set of guiding principles as it works to implement its mission:
- Foster partnerships and collaborative projects between industry, the environmental community, and stakeholders not traditionally involved with climate change to leverage scarce resources and disseminate effective strategies;
- Give priority to worthwhile initiatives that, without the Trust's involvement, would not otherwise go forward;
- Evaluate the environmental, economic, and social results of the Trust's efforts and share those evaluations publicly to advance the state of knowledge of effective strategies to address climate change;
- Develop a diverse portfolio of activities to mitigate the effects of greenhouse gas emissions, balancing cost effectiveness with environmental, economic, and social benefits and accepting a degree of risk consistent with legal or other requirements associated with a given source of funds; and
- Encourage creativity and ideas from non-traditional sources given the ample room for innovation in this field.

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1.2.4.8 World Bank Prototype Carbon Fund

A US $150 million pooled carbon-offset fund managed by the World Bank Group. Will favor investments in projects that are already receiving financial support from the Bank.

The objectives of the program are as follows:

1. High-Quality - The PCF funds projects that produce high quality greenhouse gas emission reductions which could be registered with the United Nations Framework Convention on Climate Change (UNFCCC) for the purposes of the Kyoto Protocol. To increase the likelihood that the reductions will be recognized by the Parties to the UNFCCC, independent experts provide baseline validation and verification/certification procedures for emissions reductions that respond to UNFCCC rules as they develop.

2. Knowledge - By transacting the business of reducing greenhouse gas emissions, the PCF is developing a knowledge base of business processes and practice to facilitate climate-friendly investment and inform the ongoing UNFCCC negotiations. PCF is pioneering approaches to achieving

environmentally credible emissions reductions beginning with defining baselines for more climate-friendly activities to verification, certification, and transfer of emissions reductions achieved. The analyses, independent opinions, and contracts which underpin this process will be made public, along with lessons learned.

3. Public-Private Partnership - Finally, PCF resources are provided by both the public and private sectors. The PCF demonstrates how insights and experience from both sectors can be pooled to mobilize additional resources for sustainable development and address global environmental concerns. The active participation of both sectors ensures that the PCF operates efficiently and in accordance with the Kyoto Protocol while serving the interests of World Bank client countries.

The PCF is endeavoring to achieve a balanced portfolio both geographically and technologically. Approximately half of the investments will be made in Economies-in-Transition demonstrating JI, and half will be made in developing countries facilitating the CDM. The major emphasis will be placed on renewable energy and energy efficiency projects, which have a great potential for replication and for reducing climate change at a reasonable cost.
Normally, the PCF purchases emission reductions from projects directly, and not through intermediaries. However, PCF sometimes also works through established intermediaries, such as local or regional energy investment funds, energy service companies, commercial banks, and others to aggregate smaller projects efficiently and build capacity for smaller economies to supply high quality, attractively priced emission reductions.

Minimum Requirements for PCF Projects
Type of Project
Greenhouse gases targeted should be those covered under the Kyoto Protocol (CO2, CH4, N2O, HFCs, PFCs, and SF6)
Projects related to Land Use, Land Use Change and Forestry cannot be located in non-Annex I countries before the Parties to the UNFCCC make a decision on this issue.

Location of Project
Country where the project is located should be a signatory to the UNFCCC. (http://www.unfccc.de/ and go to short cut ‘parties’).
Project should identify specific locations for its implementation.

Expected Schedule
Project should start no later than December 2003.
Project should be operational before January 2008.

Financing Sought
PCF contribution will be no less than approximately 2%, nor more than approximately 10% of the fund’s assets (roughly 3 - 15 million US dollars). PCF will not provide debt and/or equity finance for the baseline component of the project. The baseline component of the project should be financed by other sources.

Technical Summary of Project

The Project should be replicable and/or facilitate technology transfer for the country.
Technology to be applied must be an established and commercially feasible one in somewhere other than the country in consideration.
Project proposals should contain sample cases of the technology applied in the past in order to show its commercial feasibility.

Expected Environmental Benefits
Estimated cost of emission reductions should preferably be less than US$10 per ton of carbon (tC), which is equivalent to about US$3 per ton of CO2.
Baseline or reference scenario should represent the most likely Business-as-Usual scenario in the country (e.g. with regards to fuels mix, planned expansion of electricity grid, etc.)

Contact Details
Prototype Carbon Fund
World Bank Group
1818 H Street, NW
Washington, DC 20433
USA
www.prototypecarbonfund.org

1.2.5 Environmental and Energy Commodities Brokerage Houses

1.2.5.1 Cantor Fitzgerald Environmental Brokerage Services

The above is one of the largest environmental securities and electronic wholesalers of financial instruments, including GHG emissions structures.

Cantor Fitzgerald currently offers services to structure and broker emission reduction transactions. It has also launched a new online platform for conducting trades, Co2e.com. Register on website to participate in a "virtual" GHG emissions trading deal.

Contact Details
CO2e.com
102nd Floor
One World Trade Center
NY, NY 10048
USA
Tel: +1 212 938 8700
Fax: +1 212 938 7775
www.co2e.com

1.2.5.2 Natsource GHG Emissions Trading Desk

A leading over-the-counter broker of GHG emission instruments. Buyers and sellers are matched, and their identities are disclosed only after an agreement on price has been reached.

Contact Details
Neil Cohn
Principal
Natsource
140 Broadway, 30th Floor
New York, NY 10005
Tel: + 1 212 232 5305
Fax: + 1 212 232 5353
www.natsource.com

1.2.5.3 EcoSecurities, Ltd.

A leading strategic consulting group and over-the-counter broker of GHG emission instruments. They are particularly active in carbon sequestration projects. EcoSecurities advises clients on all aspects of greenhouse gas mitigation in the forestry, energy, corporate and policy-making sectors.

Contact Details
Mark Stuart
EcoSecurities, Ltd.
The Delawarr House
45 Raleigh Park Road
Oxford, OX2 9AZ, UK
Tel: +44 1865 202 635
Fax: +44 1865 251 438
www.ecosecurities.com

1.2.5.4 Trexler + Associates, Inc.

Trexler and Associates is an internationally recognized leader in the emerging field of climate change, risk management and in identifying and implementing greenhouse gas emissions reductions and offset strategies.

They have worked with gas emitters and others since 1991 to assess their future regulatory and financial exposure under alternative policy regimes and to identify market opportunities arrising from the publics growing concern over climate change.

Their clients include some of the world's best known companies and agencies such as the World Wildlife Fund, the United Nations Development Programme and the World Bank

Trexler and Associates is a GHG emissions broker, financial intermediary, and provider of specialized consultancy services related to carbon offset project development.

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Tel: + 1 503 786 0559
Fax: + 1 503 786 9859
E-mail: taa@teleport.com
www.climateservices.com

1.2.5.5 The Carbon Trader

Australian brokerage house and consultancy that offers trading, risk management, GHG auditing, and other financial analysis services.

Contact Details
Alistair R G Paton
Chief Executive Officer
The Carbon Trader
Level 1, 101 Sussex Street Sydney, NSW Australia 2000
Tel: +61 2 9239 4607
Fax: +61 2 9267 6066
email: argp@thecarbontrader.com
www.thecardbontrader.com

1.2.5.6 Carbon Values

An emerging Norwegian financial intermediary and broker of carbon offset projects.

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Fax: + 47 67 15 02 50
jsa@carbonvalues.com

1.2.5.7 Woodrising Consultants, Inc

In addition to acting as a consultant on CDM and carbon offset project management and development, Woodrising also serves as a marketing agent and intermediary

between investors in North America. Appears to have a specialization in forestry and agricultural sequestration activities.

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Fax: +1 519 927 0549
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www.woodrising.com

1.2.5.8 International Petroleum Exchange

Described as "Europe's leading energy exchange," the IPE ultimately expects to structure a bilateral over-the-counter market and a secondary market with risk management and planning services for GHG emission trades. IPE may also be the focal platform for a U.K. GHG emissions trading exchange program.

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IPE
International House
1 St Katharine's Way
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Fax: +44 (0) 20 7481 8485
www.ipe.uk.com

1.3 Traditional Loan and Equity Funders

1.3.1 CDC - CDC Group

Introduction

The CDC Group, formerly the Commonwealth Development Corporation, is a leading equity investor in emerging markets.

History

They are currently involved in over 400 businesses and they have US$2.5 billion invested in more than 50 developing countries. They provide direct investment and in certain instances, management and technical expertise to the businesses in which they invest.

Focus

Region

CDC identifies and supports commercially sustainable business ventures in emerging markets where they can become an added-value partner. The Americas are the top region for CDC investments accounting for 30% of the total equity portfolio at the end of 1999. They are followed by Africa accounting for 27%, South Asia accounting for 23% and East Asia and the Pacific accounting for the remaining 20%. There is no dedicated office in Namibia, however CDC is interested in making investment there. Enquiries should be directed to the South African office (details below).

Sector

On a sectoral basis, infrastructure accounts for the largest portion of investments with 35% of the total equity portfolio invested in infrastructure at the end of 1999. This is followed by the food and agri-business sector (23%), financial institutions (22%), the industrial sector (17%) and telecommunications (3%). In Africa, 54% of CDC investments are in agri-business

Terms and Conditions

CDC invests primarily in equity or equity-related finance and can arrange the provision of debt finance. They look for commercial returns on investments commensurate with the risk involved. CDC will invest between US$0.5 million to US$60 million in any one investment.

Contact Details

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Web: http://www.cdcgroup.com

South Africa Office, Johannesburg
(Botswana, Lesotho, Namibia)
Cradock Heights, 21 Cradock Avenue
Rosebank
2196 Johannesburg
Tel: +27 11 327 6363
Fax: +27 11 327 7407
E-mail: safrica@cdcgroup.com

1.3.2 FINNFUND - Finnish Fund for Industrial Co-operation Ltd

Introduction

The Finnish Fund for Industrial Co-operation Ltd (FINNFUND) is a fund management company which comprises, apart from FINNFUND itself, also other managed public and private investment funds. In carrying out its activities, FINNFUND supports the best international business practices and observes accepted social, ethical and

environment-related principles. FINNFUND participates actively in developing projects, both investing risk capital in, and providing loans for, capital expenditure projects that have sound economic profitability. FINNFUND 's role is to act as a catalyst, and it seeks to operate in a way that mobilises private funds for the projects it finances. The targets of FINNFUND 's financing can be industrial and service businesses, infrastructure or the financial and capital markets.

History

In Africa, FINNFUND's operations have mainly been in cooperation with the British company, CDC Group plc. In 1999 30 project initiatives were under preparation. During the year 12 financing commitments were made with a combined value of FIM 186.4 million. Of this total, FIM 96.1 million is equity investments, and FIM 90.3 million is in loans. The majority of the new investment decisions involved projects in developing countries.

FINNFUND has invested USD 12 million in the AIG African Infrastructure Fund registered in Mauritius. AIG African Infrastructure Fund was established in 1999 to invest in infrastructure and related industries in Africa. The sponsor of the Fund is The American International Group (AIG), and the Fund's major investors include the International Finance Corporation (IFC), the African Development Bank (ADB) and the European Group (including FINNFUND, European Investment Bank (EIB), Nordic Development Fund (NDF), Norfund, Proparco, Swedfund and State Secretariat for Economic Affairs of Switzerland (SECO)). The Fund has currently approximately USD 400 million available for investments.

The Fund's primary objective is long-term capital appreciation through investment in equity, quasi-equity and convertible debt instruments in infrastructure-related companies and projects in African countries.

Focus

Region

The Fund will initially focus in fourteen countries that have a positive investment climate for infrastructure: Botswana, Côte d'Ivoire, Egypt, Ghana, Kenya, Morocco, Mozambique, Namibia, Republic of South Africa, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe.

Sector

The FinnFund allocation of resources by sector in 1999; Telecomms 6% Finance and Consulting 20% Construction Materials 11% Metals and Machinery 7% Chemical Industries 16% Food Industries 1% Other 7% Energy Supply 23% Forestry 7% Wood Processing 2%

Terms and Conditions

The Fund's investment will typically range in size from USD 10 million to USD 50 million.

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Finland
Tel: +358 9 348 434

Fax: +358 9 3484 3346
E-mail: finnfund@finnfund.fi
Web: www.finnfund.fi

1.3.3 IBRD - International Bank for Reconstruction and Development

Introduction

The International Bank for Reconstruction and Development (IBRD) was established in 1945 as the main lending arm of the World Bank. IBRD makes loans only to creditworthy middle-income borrowers at market-related rates. Assistance is provided only to those projects which promise relatively high real rates of economic return to the country.

It is owned by 180 countries which have subscribed to its capital. Under its Articles of Agreement, only countries that are members of the International Monetary Fund (IMF) can be considered for membership of the IBRD. It obtains most of its funds through medium- and long-term borrowings in the capital markets of Europe, Japan and the United States. It also borrows at market-based rates from central banks and other government institutions.

Apart from borrowings, significant amounts also come from the IBRD's paid-in capital, from its retained earnings and from the flow of repayments on its loans.

History

In 1998, total World Bank lending to borrowers in Africa was US$ 2 874,8 million only US$ 57,4 million of which fell under the IBRD facility. This was due to the fact that the GNP per capita of most sub-Saharan African countries falls below the IBRD facility cut-off point of US$ 925.

Focus

Region
All middle income countries

Sector
The IBRD lending was applied in the water supply and sanitation sector, with US$ 45 million for a project in Lesotho and US$ 12,4 million for Mauritius. South Africa, Namibia, Botswana, Mauritius, Gabon and others are also classified as countries eligible for IBRD funding only.

IBRD Lending by Sector in 2000 was as follows, Finance and Private Sector Development 15%, Public Sector Development 15%, Public Sector Management 14%, Infrastructure 16%, Urban Development 5%, Agriculture & Environment 14%, Economic Policy 8%, Human Development 16%, Other 12%.

Contact details:

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Fax: +1 202 4776391
Headquarters, Europe, Paris
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Fax: +33 1 40693066
South Africa Office, Pretoria
Tel: +27 12 3423111
Fax: +27 12 3425151
http://www.worldbank.org/html/extdr/backgrd/ibrd/

1.4 Finance Sources for Private Entrepreneurs and Businesses

1.4.1 Introduction

Several of the funders mentioned in the International Development Finance Institutions section and Tradional Loan and Equity Funders section also extend finance to private enterprise. As the details of these funds are not duplicated again in this section the reader should also refer to the following possibilities when in need of private enterprise funding:

International Development Finance Institutions

- AEF
- Cofides
- DBSA

Traditional Loan and Equity Funders

- CDC

Global Climate Change Funding

- GEF
- List of possible CDM and JI Funders

1.4.2 IDC - Industrial Development Corporation

Introduction

The Industrial Development Corporation (IDC) is a self-financing state owned national development corporation that has traditionally developed business activities in South Africa. The IDC was instrumental in developing South African industrial giants such as Iscor and Sasol and is still involved in mega-projects such the Mozal smelter in Mozambique. The IDC acts as a financier providing finance to entrepreneurs engaged in competitive industries.

History

The IDC increased investment assistance in 2000 from R3.3bn to R4.2bn.

Focus

Region

The IDC has in recent years moved away from its traditional financial role in two ways: financing projects in other SADC countries and moving into the financing of SMME development in a more meaningful way. The IDC is now involved in thirty projects in nine other SADC countries.

Sector

Sector Distribution of Approvals in 2000 were as follows; Fabricated metal 5%, Machinery and Equipment 4%, Non-metallic minerals 2%, Motor vehicles and parts 6%, Iron, steel and non-ferrous metals 4%, Other 1%, Furniture 2%, Textiles, clothing, leather and footwear 10%, Food and Beverages 6%, Mining 13%, Agriculture 16%, Wood, Paper and Printing 15%, Chemical 16%.

The following regional and sectoral investment have been made by IDC,

Botswana	Mining Furniture
Lesotho	Mining
Mauritius	Sugar and Power
Namibia	Mining, food processing, textiles
Swaziland	Distillery, forestry
Tanzania	Pharmaceuticals, mining, fisheries and agriculture
Zambia	Mining
Zimbabwe	Mining

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Fax: +27 11 269 3116
E-mail: idc@idc.co.za
Web: http://www.idc.co.za

1.4.3 PSD - Private Sector Department

Introduction

The Private Sector Department (PSD), formerly the Private Sector Development Unit or PSDU, of the African Development Bank (ADB) implements the ADB's policy for private sector operations.

The Bank's assistance complements and does not compete with private sources of finance and its role is to stimulate and support initiatives by entrepreneurs, investors and bankers.

History

In 1999, private sector investments by the AfDB were: manufacturing (33%), financial services (28%), infrastructure (18%), tourism (11%), oil and mining (5%), fisheries (3%), energy services (1%) and health (1%). The 1999 allocated disbursement is approximately US$ 440 million.

Focus

Region

The focus of the African Development Bank's private sector financing and assistance is in areas and activities which portend long-term development prospects for the private sector in Africa.

Sector

These include advisory services, traditional project financing in various sectors including energy, manufacturing, agribusiness, transport, infrastructure, extractive industries, banking and finance and tourism. The bank also promotes infrastructure projects by providing financial support through direct equity investment and the provision of loans, advice to enterprises on the structuring of such projects and advice and assistance to governments to introduce a conductive legal and regulatory framework.

Privatisation has become an important component of economic policy which the Bank encourages through both technical assistance and advisory services, as well as financial assistance in the form of loans, equity participation or underwriting.

The PSD also provides assistance to small and medium sized enterprises and encourages the development of private financial institutions.

Terms and Conditions

PSD provides for the use of a broad range of investment instruments, including loans, equity and quasi-equity, guarantees, loan syndications, underwriting of equity issues and lines of credit to financial intermediaries.

Assistance is provided directly and through financial intermediaries such as commercial banks, investment funds and specialised financial institutions.

The bank's equity investment will not normally exceed 25% of the share of the capital of any enterprise. The Bank would normally not be the single largest financier in a project.

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Private Sector Department
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Tel: + 225 20 204057
Fax: + 225 20 205967
E-mail: l.borin@afdb.org; r.westling@afdb.org

1.4.4 APDF - Africa Project Development Facility

Introduction
The Africa Project Development Facility was established in 1986 as a joint venture of the African Development Bank (ADB), the United Nations Development Programme (UNDP) and the International Finance Corporation (IFC) to assist African entrepreneurs and promote small and medium sized business. This is achieved by assisting with feasibility studies and business plans and helping secure finance for commercially viable projects.

IFC is the Executing Agency for the APDF and as such is responsible for the day-to-day operations of the agency.

History
It has completed financial arrangements for more than 359 projects in 34 African countries for an estimated total investment cost of more than US$ 150 million.

Focus
Region
The region of focus is Africa with projects evenly spread across the continent.

Sector
Some 35% of projects are in the manufacturing sector with a further 27% in the farming and agro-indutry sector. In South Africa, the APDF has assisted with a number of projects, for example cut flower production.

Terms and Conditions
It typically supports projects with investment costs ranging between US$ 150,000 and US$ 4.5 million but also considers smaller projects.

Contact details:

South Africa Office, Johannesburg
Tel: +27 11 325 0720 /8
Fax: +27 11 325 0582
Southern Africa Office, Harare, Zimbabwe
Tel: +263 4 794 860
Fax: +263 4 793 805

1.4.5 Solar Development Group

Introduction
The Solar Development Group (SDG) has been created to accelerate growth of the off-grid solar photovoltaic (PV) industry.

Triodos Bank and its partners Environmental Assistance Fund and Global Transition Consulting created the Solar Development Group. The group was launched in March 2000 with initial funding from the World Bank, IFC and the Rockefeller Brothers Fund. The Solar Development Group with total capital of around US$50 million for a 10 year program, is one of the largest in this promising sector in the world.

Focus
Region
ALL Developing Countries.

Sector
The SDG seeks companies in developing countries with high growth and profit potential to be considered for business development, support and investment. Ideal candidates should have some track record in the cash market or are start ups backed up by strong partners. Financial institutions providing PV consumer financing are candidates as well

Terms and Conditions
It is comprised of two sub entities, these include, The Solar Development Foundation and Solar Development Capital.

- *Solar Development Foundation:*
The SDF will primarily provide Business Development Services. This includes, market research and testing, PV training and technical assistance, end user financing mechanisms and business planning. The target enterprises include, Energy Service Companies, Distribution or retail companies, Manufacturers or assemblers and finally financial institutions. The foundation would provide financial assistance in terms of cost sharing grants and pre investment loans.

-*Solar Development Capital*
Provides small and medium-scale investments of between US$100 000 – 2 million in the form of either minority equity, convertible debt or senior debt.

During 2000 they provided intensive business development support to 10 enterprises in 7 developing countries. They are helping companies with pilot projects, setting up business plans, carrying out market surveys and improving company structure. They

have supported companies that market and sell solar home systems, including a manufacturer of advanced electronic components for solar home systems. Through the groups separate commercial investment fund, it provides expansion capital to enterprises with feasible business plans. The investments made are mainly in form of risk bearing shares in the company. It is managed by a team of three co-workers from Triodos Bank and six from Triodos partners in the US, in close cooperation with many experts in the countries involved.

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Phone +31 30 693 6578
Fax + 31 30 693 6566
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1.4.6 Renewable Energy and Energy Efficiency Fund (REEF)

Introduction
REEF actively seeks to make minority equity and quasi-equity investments in profitable, commercially viable private companies and projects in sectors that include: electricity generation primarily fuelled by renewable energy sources, energy efficiency and conservation, and renewable energy/efficiency product manufacturing and financing. These can be on or off-grid.

The fund was launched in February 2000 and is the first global fund to tap the sizeable opportunities to invest in emerging markets renewable energy and efficiency.

Focus
Region
Emerging market countries worldwide eligible for IFC financing, including markets in Africa, Mexico and Latin America, the Caribbean, Asia, and Central and Eastern Europe..

Sector

- Low Impact Hydro
- Solar PV
- Geothermal
- Biomass
- Energy Efficiency
- Hydro

Terms and Conditions
The REEF will consider investment projects with total capitalization requirements of $500 000 plus. REEF's investments may take a variety of forms including common and preferred stock, partnership and limited liability company interests, and convertible or subordinated debt with equity warrants/options. REEF may also make loans to projects or project sponsors on a bridge or permanent basis. Equity

transactions are typically structured so that the entrepreneur retains the majority of shares and/or management of the company.

Contact Details
Energy House Capital Corp.
383 Franklin Street Bloomfield,
NJ USA 07003
Tel: (973) 680-9100
Email: capital@energyhouse.com

1.4.7 E&Co – An Energy Investment Service

Introduction
E&Co aims to support commercially viable Energy Enterprises that deliver reliable, affordable and clean energy in developing nations. Based on the experiences of the Rockefeller Foundations "Global Environmental Programme". E&Co was established as an independent non-profit organisation in 1994. It is based in Bloomfield New Jersey.

The strategy is to build in-country human capacity, nurture local enterprises and accelerate project implementation by providing two basic services:

- Enterprise Development Services
  Young businesses require varying levels of support to move from the initial development concept stage through to a "bankable" stage when a project can confidently be presented to investors. E&Co aims to provide EDS to assist the entrepreneur to develop or refine the proposed business approach and to ensure the right issues are being addressed from the human, financial and technical capacity points of view.

- Start-up Finance

E&Co serves the purpose of bridging the gap between the enterprise and sources of capital when access to traditional capital is most difficult. It therefore provides early stage investment of between US$25 000 – US$250 000 in the form of debt or equity so as to fast track the development of the project. These investments typically reflect near market terms and conditions, with the exception that E&Co will tolerate a relatively high level of risk without seeking classic venture capital returns.

History:
E&Co has made investments in 58 projects in 27 countries to the value of US$ 7,627,527

Focus
Region
It has established a network of global offices and representation in Latin America, the Caribbean, Asia and Africa.

Sector

Involves organisations whose primary business involves affordable clean energy in a commercially viable way.

Terms and Conditions
In order to qualify for E&Co assistance the project or enterprise needs to ensure the following:

- New Money for New Energy

There should be a focus or utilisation of renewable energy or energy efficient technologies in a commercially sustainable manner.

- Social and Environmental Elements

E&Co assistance must be imperative for the further development of the project i.e. without E&Co assistance it will be unable to proceed.

- Technology

The endeavour should result in a positive impact on the surrounding social and/or environmental conditions. For example create employment, improving quality of life, decrease rate of deforestation.

- Human Capacity

The project or enterprise sponsors should have the technical and managerial experience to sustain the success of the venture.

- Reasonable Risk

An assessment of the proposed operating environment should illustrate that the risks are reasonable enough to attract investment.

- Technology

The proposed technology should be suitable in terms of cost, affordability and environmental impact.

- Policy Frame Work

The enterprise or project should influence policy makers and decision makers to support renewable energy and energy efficient initiatives.

+

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Southern and East Africa
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Web: www.energyhouse.com

References

Africa Project Access and Whitehouse and Associates, 2001. International Development Finance Institutions and Selected Related Organisations, Guide to Aid Agencies, CD Rom, July 2001.

Hodes, G, 2001. Securing Third Party Finance fro CDM Projects (draft), in *CDM Handbook for Southern Africa: A tool for Project Developers*, Energy and Development Research Centre, forthcoming.

Internet, 2003. An in depth search of all funding possibilities and research of each mentioned funder's website. See content for references of web addresses under each funder's *Contact* category.