

How to Prepare and Present Proposals

Trainers' Workbook

Prepared for UNFCCC

By

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Workshop and Workbook Schedule and Framework		
Session 1-Overview	Session 5-What and Where?	Session 10-Targeting and Presenting
Session 2-Method	Session 6-Who and How?	Session 11-Customization and Summarization
Session 3-Numbers	Session 7-Why?	Session 12-Teaching Others
Session 4-Process	Session 8-Base Case	
	Session 9-What If?	

Trainers' Workshop and Workbook Framework

- Each session will include a lecture, discussion and feedback on the presentation of information and technique. Most sessions will contain exercises aimed at explaining or reinforcing the subjects. Sessions and Lessons within sessions will be organized into time segments of approximately 50 minutes with ten minute breaks hourly.
- Each session will be self-contained in this Trainers' Workbook. Each session will include 5-10 minutes for Trainers to note their comments and suggestions on Session Feedback Pages
- Workbook will be in "loose-leaf" format to allow for the last-minute insertion of final slides and teaching aids

## Session One - Trainers' Workshop Overview

### Session 1 Overview

- Why are we here?
- What are we expected to accomplish?
- What information and techniques will we share?
- What are the different examples and problems we will work on?
- How will we critique our work?

Information → Technique → Cases → Teaching Options  
→ Feedback → Improvements

Organizing Principle: *“Improving our capacity to prepare complete and balanced proposals shortens the path from good ideas to implementation.”*

Session Objectives-to set forth the workshop agenda, method and schedule; to introduce the challenge being addressed and its urgency; to propose a collaboration on how to improve the content we would offer to future trainees.

#### Information Content-

This session deals with logistics, schedule and deliverables. It defines both the objectives of this Trainers' Workshop and the proposed training to be offered in the future.

#### Technique Content-

We are trying to bridge a substantial communications and language gap among professionals. Without offending their professionalism or the vocabulary of their specializations, we are attempting to introduce a broader, more common vocabulary and technique regarding what should be included in a complete and balanced proposal. This session introduces a series of terms and related concepts.

#### Structure -

Lecture covering Information and Technique Content, followed by an introduction of the participants, a question and answer exercise and a first feedback session to reinforce participants' role as trainers as well as trainees.

#### Exercise and Questions-

1. You are preparing a budget: how is it a proposal?
2. You need to get a trip authorized: how is this a proposal?
3. A school needs books. You decide to raise money for the school? Who is the Champion and how is your decision a proposal? Who are the enablers?

Feedback and Discussion- Is the content clear? If you were leading this training session how else might the content be introduced? There are different ways to communicate the importance and relevance of the content and the course. Here we have chosen to emphasize the need to accelerate the transition to sustainable development. We could have used other “hooks” to emphasize the importance of this training – for example, career advancement, skills diversification, growth of a person’s work unit. Given the international government organization audience being trained but the final target of business people, development advocates, environmental specialists as well as government and IGO – what reasons do you think should be emphasized to capture the attention of participants?

Terms and Concepts from this session-

Proposal ... Champion ... Enabler ... Seven Question Method (or Approach)

Trainer Notes for this session cover the Challenge being addressed by this work shop; the essence of what comprises a proposals; overview of the seven question method; and the importance of using introductions to determine the practical experience of participants.

#### Trainer Notes

1/ The Challenge - This Trainers’ Workshop, the training you will provide in the future, the UNFCCC publication “Preparing and Presenting Proposals”, other text and software products and the network of professionals you are now part of have a single, focused purpose: to improve the odds that good ideas – ideas essential to sustainable development, climate change mitigation and adaptation and myriad other challenges -- will attract the resources needed for successful implementation.

There are many good ideas, and ideas are powerful. Unfortunately, most do not get beyond the “idea stage” because rarely can a single person assemble all the resources needed and do all the work required to convert an idea into a reality. Margaret Mead wrote that we should never underestimate the power of a few committed men and women to change the world. What this workshop and its related activities want to do is to increase the chances of success for those men and women and shorten the path between idea and implementation.

2/ The Essence of a Proposal- To obtain resources we must be able to explain our ideas clearly, be convincing that these ideas can be implemented and know what is needed to succeed. That is what a proposal does. A proposal consists of a plan to do something, combined with a request for resources.

There are common, logical ingredients that most well-prepared proposals contain. Understanding and demonstrating a mastery of these common ingredients, combined with knowing the audience, will greatly increase the chance of success. Making sure that the finished product is as complete and as balanced as practical is the objective of proposal preparation; getting the resources needed to actually proceed with implementation, however, is the goal. A brilliant proposal that goes nowhere is but an intellectual exercise.

3/ Overview of our Method - Journalists are taught to make sure that their reports answer the questions Who? What? When? Where? Why? A complete proposal should answer a similar set of questions.

- What is being proposed? → *Concept*
- Where will the proposal be implemented? → *Setting*
- Who will champion the proposal and see it to completion, and who else must be involved? → *Team*
- How will the proposal be implemented? → *Plan*
- Why is the proposal important and why should it be supported? → *Expectations*
- What if things do not go as planned? → *Contingencies*
- To Whom is the proposal addressed? → *Audience*

A proposal that addresses these questions will meet the entry requirements of lenders, investors, donors, grant-makers, carbon professionals and service providers. The challenge is to do a fine job on each of these points,

A proposal is a bridge between two groups of people: Champions and Enablers. Champions are the people who convert ideas into action. They take on the chores and responsibility and make the needed commitment. These are the men and women who generally understand best what must be done to succeed and are the ones who realize what resources – expertise, money, skills – must be obtained. Champions can be individual entrepreneurs in the private sector, or civil society representatives or part of government. The institutional home or title assigned to these men and women does not matter a great deal. It is their commitment that does.

Enablers are the people who have the resources and knowledge Champions need. Enablers can be financial investors or representatives of government programmes; philanthropists or private voluntary organizations; niche professionals engaged in subjects such as carbon mitigation and adaptation; and many others. Enablers are looking for ideas to support. They may do so for financial, social, environmental or other reasons or for a combination of benefits.

4/ Introductions – it is important to determine who has practical experience with finance, who has prepared proposals and who has received and evaluated proposals. If possible, Contact participants in advance and ask them to suggest areas of emphasis.

#### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**

**Suggestions and Improvements:**

**What I might do differently when teaching this material:**

## Session Two - Method

### Session 2

#### Method: Seven Questions

- Information-the seven key questions
- Technique-building block approach
- Information-content for two of the five proposals
- Exercise-as a group we will conduct a preliminary inventory of two proposals, identify the seven key pieces of content (or not) and address a core issue: “Is it clear what is being requested?”

Session Objectives-to introduce the Seven Question Building Block Approach to preparing proposals

Information Content-Overview of a sample of the proposals prepared by participants ... overview of “sample proposal” (which will be used later to illustrate the use of the templates).

Technique Content-Building Block (template or questionnaire-based) Approach to Proposal Preparation

Structure –

Lecture, Exercise, Discussion and Feedback

Exercise-Using a checklist we will conduct an inventory of the first few pages of at least two proposals.

Questions and Discussion-Did the lecture and examples, followed by the questions reinforce the building block elements? How else might we have presented this approach? Was the exercise too long or basic? How else might this basic information be emphasized? Would this exercise work in all settings?

Terminology-Core Concept or Concept ... products, services, technology, customers ...

#### Trainer Notes

1/ A proposal consists of a “Champion’s” plan to do something combined with a request to an “Enabler” for resources. It is important that the proposal be viewed as the bridge between good ideas and capable people to equally capable people who have resources essential to implementation. Conversely, organizing a brilliant proposal that is presented to the wrong party, or organizing only one part of a good idea –e.g., a description of technology – is a path to frustration. A proposal that addresses the following seven questions in a complete and balanced way has a better chance of being considered seriously than a less complete or out-of-balance proposal.



WHAT? → What is the Core Concept? → What are the products, services and technologies being proposed? These comprise the “what” of a proposal.

WHERE? → Where is this proposal located? → The region, industry and market where the core concept will be implemented define the “where” of the proposal.

WHO? → Who makes up the complete team needed to succeed → The institution, company, community or individual(s) who will have the responsibility for converting what is being proposed into action and results comprise the “who” of the proposal, the parties at risk of failure and responsible for action. This is not just the Champion but all the people and institutions needed along the way.

HOW? → How will this idea be converted first into a plan and then into actual implementation? → The planning, finance, operations, construction, management, monitoring and evaluation elements comprise the “how” of the proposal.

WHY → Expectations and benefits → The financial, social and environmental implications, the possible impacts and outcomes – both positive and negative – the risks and rewards, the threats and the opportunities being set forth in the proposal; together these constitute the “why” of a proposal.

WHAT IF → Contingencies → “What If” things do not go as planned?

TO WHOM → The audience → A well-prepared proposal conforms to the needs and processes of the enabling organization from which resources are needed. It concentrates on *its* expectations, *its* needs and *its* processes.

## 2/ SAMPLE

WHAT? → What is the Core Concept? → Converting animal waste into energy, fertilizer and carbon credits.

WHERE? → Where is this proposal located? → Agricultural Region with a few concentrated commodities.

WHO? → Who makes up the complete team needed to succeed → Public-private venture organized as a private business but able to access a modest amount of planning, construction or operating subsidy.

HOW? → How will this idea be converted first into a plan and then into actual implementation? → Requires 24 months and \$45,000 of planning; \$1,000,000 for design, land acquisition, construction and commissioning; will produce \$140,000 to \$304,000 a year in revenues and will cost about \$125,000 a year to operate.

WHY → Expectations and benefits → Reduction of waste and pollution, avoidance of fossil fuel purchases, jobs, cleaner water and air. We “think” this venture could repay all of its costs and produce a positive but modest rate of return.

WHAT IF → Contingencies → Could cost more, produce less or prices could be inaccurate.

TO WHOM → The audience → Looking for some grants to defray a portion of up-front costs; looking for someone to finance the venture.

**Session Feedback Notes**

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Three- Numbers: Accounting, Finance and Scheduling Concepts

### Session 3 - Numbers: accounting, finance and scheduling concepts

- Information: key terms used in the quantitative portions of proposals
- Technique: debt service, net present value, internal rate of return ...income statement, balance sheet ... planning, construction and operations
- Exercise: simple payback ... compound interest calculations

Organizing Principle: *“If we cannot count it we cannot measure or control it.”*  
*“Whether we like it or not money is a language that cuts across languages, cultures and disciplines. It is a way of expressing actions and consequences.”*

Session Objectives-to establish a common basis for gathering and interpreting proposal data that can be quantified

Information Content-interest and discount rates, cash flow, time value of money, templates ...

Technique Content-scheduling, net present value, internal rate of return ...

Structure-combined lecture and exercise (50 minutes for accounting and scheduling, break, 50 minutes for finance and 1<sup>st</sup> exercise, break; 50 minutes for finance and 2<sup>nd</sup> exercise); discussion; tutoring as needed

Exercises – “Ellen and Niki Buy a Coffeepot” Parts 1, 2 and 3

Feedback-it is especially important to discuss the ease or difficulty of transferring these financial concepts, the usefulness of “back and forth” and the type of example to be used. There is a lot to communicate in this session. Is it too much? How else could it be done?

Terminology- Capital budget and plan ... operating budget and plan ... Income Statement ... Balance Sheet ... Cash Flow ... Planning Period ... Construction and Pre-operation Period ... Operations or Operating Period ... interest ... interest rate ... discount rate ... Net Present Value ... Internal Rate of Return ... Debt Service...time value of money... Triple Bottom Line

1/ This session contains three separate lessons: how to schedule and budget; how to present financial results; and, how to evaluate, present and compare different ideas and proposals using the “time value of money”.

When preparing and presenting a proposal, money, time and impacts act as a language that communicates between Champions making proposals and Enablers receiving them. Within that language, “accounting” is the set of conventions that record and report the inflows and outflows of money. “Finance” is the part of the language that describes how something is owned and is to be paid for. “Impacts” refer to the financial, economic, social and environmental results which a proposal is expected to yield, and “scheduling” is the art and science of matching activities and resources over time. Often, lack of clarity in communication between Champions and Enablers can be traced to differing understandings in regard to these four items.

2/ For the Accounting and Scheduling lesson six concepts should be understood:

- Capital budget and plan
- Operating budget and plan
- Income statement
- Balance sheet
- Cash flow
- Variance analysis

Once understood, the activities and costs should be segregated into three broad blocks of time:

- Planning
- Construction or pre-operations
- Operations

3/ For the Accounting lesson we need to communicate the basics of accounting and the ability to present “triple bottom line results:

- Financial
- Social
- Environmental

4/ For the Financial Analysis lesson the following related concepts are important and sufficient to allow conversations with the most sophisticated “financial expert”:

- Interest and return
- Net present value and internal rate of return
- Debt service and debt service coverage

## 5/ Accounting and Scheduling Concepts

### Time Periods and Scheduling

At the beginning of proposal-related communications, only three blocks of interconnected time need be examined and presented:

- ☑ Planning: From now to the completion of planning and the commencement of construction and pre-operation activities.
- ☑ Construction and pre-operation: From the completion of planning to the completion of construction and pre-operation activities.
- ☑ Operation: The delivery of products and services.

These three periods of time can overlap, but they must be kept separate at all times in terms of record-keeping and accounting.

Planning includes all the steps that must be completed in order to commence construction or installation of pre-operation facilities. Planning does not end until all contracts are signed and the funds are in place to proceed.

Construction and pre-operation includes putting in place all the “bricks and mortar” needed for a proposal to be formally implemented. Construction can be phased. Thus, operations may commence while construction is still ongoing. It is crucial that the records of planning, construction and operations be clearly separated.

“Construction” is generally considered different to such pre-operational activities as setting up offices and staff (for, say, an information distribution project). From the timing and accounting points of view, these two types of activity are nearly the same.

Taken together, the costs of planning and the costs of construction and pre-operation constitute the capital cost of a proposal.

A capital budget and plan is simply the total of all the costs of planning, construction and pre-operation stages. It includes everything that must be spent and done in order to commence the delivery of the proposed product or service. Often these are called “capital costs” (to distinguish them from costs incurred once the proposal’s operational phase begins) and any cost added to the capital budget or plan is referred to as being “capitalized”.

Operation includes proposal implementation: the sale and distribution of the product and service at the centre of the proposal. Generally, the operating phase of a proposal has both revenues and costs. In preparing a proposal it is important to estimate the revenue components both in units of output (e.g., number of kilowatt-hours, number of bed-nets) and in the value of the units.

Thus, an “operating budget and plan” picks up where the “capital budget and plan” leaves off. It is the budget of both revenue and expenses once the proposal begins to deliver the promised goods or services. The word “budget” has become associated primarily with costs but an operating budget and plan – much like a household budget – must reflect both incoming funds and outgoing costs.

Operating costs also include other elements that require explanation: depreciation, interest, taxes and amortization (principal payments), which are needed to translate operating results (revenues less costs) into an estimate of the cash flow which the proposal will generate after all costs are considered.

- ☑ Interest expense is the estimate of the amount paid on monies borrowed to implement a proposal. If the interest is paid or accrued (recorded in the time period during which it applies but paid at some time in the future) before the operation commences, this is generally called “interest during construction” and is included (“capitalized”) in the capital budget and plan. Once operations begin, the interest paid or accrued is treated as a normal expense such as labour or raw materials.
- ☑ Depreciation is the only part of the operating budget and the income statement that is not represented by a cash payment during the period or at some time in the future. “Depreciation” is an allowance used for tax purposes – an operating expense – that reflects a share of the capital cost spread out year by year during its useful life. The purpose of depreciation is to reduce your taxable income and match the revenue of a proposal with the wearing out of the assets.
- ☑ Taxes come in many forms. Most important to proposal preparation is to estimate the income taxes due as a result of the proposal’s implementation. Usually, taxes are calculated as a percentage of revenues minus all operating expenses (including interest and depreciation).
- ☑ “Amortization” or “principal payment” is a cousin of depreciation. Depreciation represents an estimate of the loss of value of an asset. It is a “non-cash” item (cheques or wire transfers are not made to “pay depreciation” as it is an accounting convention). Conversely, when money is borrowed to acquire or build a capital cost item, that money must be repaid. This repayment is referred to as amortization or principal payments. Since depreciation accounts for the declining value of all capital assets, it would be double counting to deduct principal payments (which represent payments for a portion of the asset) too, so amortization is not part of the income statement. However, unlike depreciation, this is a cash payment, so accounting makes an adjustment after finishing the income statement. What happens is that depreciation is added back and amortization/principal payments deducted; the result is the cash flow available to owners–investors. This concept is important to understanding the concepts of rate of return and the financial “bottom line.”

Note: when principal and interest payments are combined this is called “debt service”, another important concept to remember.

An “income statement” reflects operating revenues and expenses for a specific period of time, usually a year for formal statements and three months (a quarter of a year) for internal management purposes. It includes interest, depreciation and taxes.

If the purpose of an income statement is to reflect what has happened in a specific year or quarter, a “balance sheet” gives a picture of a company at a particular moment. It has three parts (the parts are sometimes given different names, but the ideas behind them are the same):

Assets represents something owned or controlled, something that has a value.

Liabilities: if assets are “things owned”, then liabilities are “things owed”. These represent all future obligations, especially loans to be repaid, monies owed to suppliers and pension obligations to employees.

Net assets are an important and somewhat difficult concept. Net assets represent the difference between assets and liabilities (assets = liabilities + net assets) and comprise the amounts provided by owners (these amounts are called “equity”) plus the accumulated results of operations (called profit or loss) minus any amounts paid to owners (these are called dividends). When liabilities exceed assets, “net assets” are a negative rather than a positive number (not a good sign).

## 6/ Finance and Triple Bottom Line

Although the world of finance is full and complex, mastering just six concepts with a pencil, paper, calculator or computer is sufficient grounding to have the most sophisticated conversations with “experts”.

These concepts are: interest rate; debt service; return on investment; net present value; internal rate of return; and debt service coverage ratio.<sup>1</sup>

7/ Interest is the cost or the value of money. It is the expense of borrowing money. Usually quoted as a percentage (and most often quoted as a fixed percentage per year or month), it is the fee paid by a borrower to a lender for the lender making funds available to the borrower. It is important for Champions to understand how interest is calculated and the best way to do this is by doing a simple exercise.

An amount of 1,000<sup>2</sup> borrowed for one year at 12 per cent simple interest requires a repayment of 1,120. The same amount borrowed at one per cent per month, compounded monthly (interest charged on interest) requires a payment of 1,127 at the end of a year. If the period is two years rather than one the result is 1,254. Do the exercises of multiplying 1,000 times 1.01, first 12 times (equals 1,127) and then 24 times (equals 1,254). This is the process of “compounding”. Interest is compounded without being stated as such (simple interest is the exception rather than the rule).

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<sup>1</sup> These terms are abbreviated so often – especially in conversation – that their abbreviations should be learned as if they are words: “i” for interest, “ROI” for return on investment, “NPV” for net present value, “IRR” for internal rate of return, “p+i” for debt service and DSCR for “debt service coverage ratio”.

<sup>2</sup> This guidebook does not focus on any particular currency.

A calculation showing 1,000 at 12 per cent interest compounded yearly for five years follows:

Year 0 (when the money is borrowed) = 1,000  
 Add 12% for year 1 = 120  
 Balance at end of year = 1,120.00  
 Add 12% for year 2 = 134.40  
 Balance at end of year 2 = 1,254.40  
 Add 12 % for year 3 = 150.53  
 Balance at end of year 3 = 1,404.93  
 Add 12% for year 4 = 168.59  
 Balance at end of year 4 = 1,573.52  
 Add 12% for year 5 = 188.82  
 Balance at end of year 5 = 1,762.34

On a calculator or spreadsheet, getting this answer would be a function of entering the present value (PV) of 1,000, interest rate (i or R) of 12%, the number of periods (n or nper) of 5 and then solve for future value (FV). In an algebraic presentation, this calculation is as follows:

$$FV = P(1 + R)^N$$

Where:  
 FV = future value  
 P = principal (initial amount)  
 R = annual rate of interest (also abbreviated as lower case i)  
 N = number of years

$FV = 1000(1+.12)^5$   
 \* = "multiplied by"  
 $1.12 * 1.12 * 1.12 * 1.12 * 1.12 = 1.7623$   
 $1000 * 1.7623 = 1762.34$

### 9/ Debt service and payment plans

Once the concept of interest is comfortably understood, the next step is to understand that there are different types of "payment plans". It is possible to pay only the interest on a loan for a period of time and then pay the principal amount in one or more payments. When a single payment of principal is made at the end, this is sometimes called a "bullet" payment.<sup>3</sup>

It is possible to pay the same amount every period (whether monthly, semi-annual, annual or any other equally spaced period). This is called the "mortgage payment" or "equal annual" method.

Another possibility commonly explored makes equal payments of *principal* amounts over a specified period of time. The interest amount paid at each time varies because the balance of the loan is declining.

Repay 1,000 over five years at 12 per cent – three methods.

Payment options	Year 1	Year 2	Year 3	Year 4	Year 5	Total payment
Bullet	120	120	120	120	1,120	1,600
Mortgage	277	277	277	277	277	1,385
Equal principal	320	296	272	248	224	1,360

Each of these schedules employs the same interest rate and time period; what varies is the debt service (schedule of principal and interest (p+i) payments).

10/ Return is a closely related concept. It is the rate of interest earned on an investment over time. It is usually a function of the amount of money invested at the beginning when compared to the amounts of money received back over time. The difference between

<sup>3</sup> Some of the illustrative calculations used here for interest, net present value and internal rate of return appeared in the Toolkit for Energy Entrepreneurs, © 2002, E+Co, UNEP and AREED.



interest and return is that interest is generally a fixed payment for the use of money, whereas return is the sum of variable payments over time.

Interest represents the rate charged for the use of money. It looks forward in time and is predictable. Return occurs over time and is not as predictable, but both represent what is often called the “cost of money”. A proposal can be to a bank (lender) to borrow money at a fixed interest rate. A proposal can also be to an investor, offering a share of future cash flow as a return on their investment (often abbreviated ROI).

11/ One way of comparing returns and interest rates is called “net present value” (NPV). By taking a certain rate of interest it is possible to compare the value of future flows of monies to the amount to be invested today. When this technique is used, the percentage rate used has a different name. It is called a “discount rate”, but this is nothing but an interest rate looking back in time rather than forward in time. The technique is quite simple to perform, either manually with a calculator or with a spreadsheet computer program such as Excel. The purpose served is quite clear: if the net present value is a positive number, that is one measure of the profitability of a proposal. If the number is zero or negative, that is a good estimate of the additional funding needed (whether by grants, subsidies, cost-cutting or revenue improvements). The most important step is selecting an appropriate discount rate.

To demonstrate this point, the preceding cash flow estimates can be looked at in reverse. What if someone offered three different ways in which they would pay for a particular product (costing 1,000) over five years?

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Case A	120	120	120	120	1,120	1,600
Case B	277	277	277	277	277	1,385
Case C	320	296	272	248	224	1,360

Each payment plan looks different. The way to compare them is to choose an interest rate that represents the fair value of having money in hand or a promise of money in the future. If the rate selected was 12 per cent and it was applied to each of the above proposals, it would be found (mathematically) that each of the proposals equals the others.

Five-year net present value at 12 per cent discount rate

	Year 1	Year 2	Year 3	Year 4	Year 5	Total payments	NPV, 12%, five years
Case A	120	120	120	120	1,120	1,600	1,000
Case B	277	277	277	277	277	1,385	1,000
Case C	320	296	272	248	224	1,360	1,000

NOTE- There are a few ways to check these results: using a spreadsheet program or the financial functions on a calculator; using factors from a present/future value table; or using an algebraic formula. Each of these solutions is demonstrated in annex V of the Guidebook, which also illustrates and explains the composition of the present/future value table.

While all of these calculation methods show that the results of the three payment plans are *mathematically* the same, there are other reasons to choose between these options. Inflation may make 12 per cent too low a discount rate, so either choose a higher one or choose the proposal that brings cash earliest. There may be a need for cash at a certain time that also makes one method more appropriate than another. The core problem with NPV analysis is that the choice of discount rates can greatly affect it. Otherwise, it is a wonderful tool for comparing different options.

12/ With the mass introduction of more sophisticated calculators and spreadsheet programs, an alternative methodology has gained currency: this is called “internal rate of return”. Internal rate of return (IRR) is the interest rate that a future stream of monies will return on an investment made today. It allows different investments to be compared. When compared to these alternatives (and to the cost of money which an enterprise might incur), the IRR on a proposal can be reliably presented.

Let us examine three cases where 1,000 is invested and three different choices exist for being repaid.

	Year 0 Amt. out	Year 1 Amt. in	Year 2 Amt. in	Year 3 Amt. in	Year 4 Amt. in	Year 5 Amt. in	Total net cash flow *
Case D	-1,000	300	240	240	270	350	400
Case E	-1,000	350	280	350	280	140	400
Case F	-1,000	350	350	300	200	200	400

\* Total net cash flow is the total “undiscounted” cash remaining after investment has been fully repaid (difference between total amount in and total amount out).

If we assign a discount rate of 13 per cent, we can determine which has the higher net present value.

	Year 0 Amt. out	Year 1 Amt. in	Year 2 Amt. in	Year 3 Amt. in	Year 4 Amt. in	Year 5 Amt. in	Total net cash flow	NPV @ 13%
Case D	-1,000	300	240	240	270	350	400	-22
Case E	-1,000	350	280	350	280	140	400	+17
Case F	-1,000	350	350	300	200	200	400	+20

Case F has the highest NPV and is the best of the three cash flows from an NPV perspective. What IRR (internal rate of return) allows us to do is to say mathematically how much better it is by calculating the discount rate that would produce a zero NPV result. See annex V for a detailed explanation of how to calculate IRR.

	Year 0 Amt. out	Year 1 Amt. in	Year 2 Amt. in	Year 3 Amt. in	Year 4 Amt. in	Year 5 Amt. in	Total net cash flow	NPV @ 13%	IRR
Case D	-1,000	300	240	240	270	350	400	-22	12.0 %
Case E	-1,000	350	280	350	280	140	400	+17	13.9 %
Case F	-1,000	350	350	300	200	200	400	+20	14.1 %

13/ As we saw earlier Debt Service is the amount paid each year to repay a loan. It consists of principal repayments (the amounts borrowed) and interest payments (the cost of money). Debt service equals principal plus interest (p+i). There are many different ways to calculate debt service, and as we have seen there are many different ways to produce the same net present value. The objective in learning about debt service is to try to match the future monies expected to the obligations being accepted. When seeking a loan, annual debt service coverage calculations are important.

Let us go back to the three debt service examples used previously and explore how to calculate debt service coverage ratios (DSCRs).

Debt service options	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Case A	120	120	120	120	1,120	1,600
Case B	277	277	277	277	277	1,385
Case C	320	296	272	248	224	1,360

For each of these years, a certain amount of money will be available to make the expected debt service payment. This amount of money is the excess of revenues over day-to-day costs. It is the amount available to pay debt service, to reinvest in the company or to pay to owners in the form of dividends. Let us make the following assumption regarding funds available to meet debt service.

Year	1	2	3	4	5	Total
Funds available	400	420	440	460	480	2,200

A debt service coverage calculation compares the amounts available by year (and for the total period of the loan) to see if there is a match (or mismatch) between the amounts to be paid under the different payment plans and the amounts required to be paid. Say you choose case A as your debt service option: in year 3 the debt service expense totals 120 and your funds available total 440, giving you a debt service coverage ratio (DSCR) of 3.7 (440/120), meaning that in this particular year for every unit of money owed you have 3.7 units available for payment. If you were to choose case B, the DSCR for year 3 is 1.6 (440/277).

Debt service options	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Case A	120	120	120	120	1,120	1,600
Case B	277	277	277	277	277	1,385
Case C	320	296	272	248	224	1,360

Debt service coverage ratio	Year 1	Year 2	Year 3	Year 4	Year 5	Years 1–5
Case A	3.3	3.5	3.7	3.8	0.4	1.4
Case B	1.4	1.5	1.6	1.7	1.7	1.6
Case C	1.3	1.4	1.6	1.9	2.1	1.6

Of importance also is the sum of all the debt service payments when compared to the sum of all the monies available to make those payments. This indicates the “average” DSCR, although differences in time make this, at best, a rough measure.

Compare these results, first as a Champion: which result produces the best cash flow for reinvestment, expansion or dividends to owners?

Now place yourself in the shoes of the person making a loan: which result is the least secure?

Answer: Case A. It is good for the project in that it frees up much cash in the early years to reinvest in the project or reward owners. It is bad for the lender because it produces the lowest overall debt service coverage ratio (1.4) and has a very risky fifth year (what if the Champion has spend all the excess monies from years 1 to 4?).

There is no right or wrong answer. Case A could be structured in a way that reduces the risk to the lender (setting aside a reserve of cash in years 1–4). The purpose of the exercise is to open our minds to the options that exist when the time value of money is incorporated into the analysis.

The most important common ingredient of the six concepts discussed in this section is time. The time value of money and other benefits is an important ingredient of any proposal. Champions and Enablers need to assess carefully what expenditures and revenues must occur over the different blocks of time.

#### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**

**What I might do differently when teaching this material:**

## Session Four – Process: Fact-finding to Base Case to Finished Proposal

### Session 4 – Process: fact-finding to base case to finished proposal

- Information Content: taking the seven questions and using these to complete a proposal
- Technique Content: template – paper or Excel-based – proposal building
- Exercise: by team, conduct an inventory of the five sample proposals

Session Objectives-to reintroduce the qualitative, building block process (after the quantitative exertions of Session Three) and transition from gathering information to treating the information as input to be assembled and analyzed ... to begin team work with a proposal inventory

Information Content-preparing a base case

Technique Content-sensitivity analyses

Structure - lecture plus exercise / inventory plus discussion ... important to reinforce all terms at this point.

#### Trainer Notes

1/ A summary and refresher regarding key terms should begin (and end) this session. It should also be noted that once this session is completed we will have put in place the information and techniques needed to construct proposals, beginning in the next sessions. So we need to make sure all our foundations pieces are solid.

2/ We have learned so far that in preparing a proposal the Champion must wrestle with the first five questions – What, Where, Who, How and Why – as a set of connected pieces, where changes in one can cause many other changes. Rarely are all the pieces crystal clear even as great volumes of information are amassed. As a result, the Champion needs to assemble as much information and as many answers as possible, all the while making reasoned assumptions of what is not known. The purpose is to construct a realistic picture of how all the pieces will come together. This realistic picture is called the base case. It reflects both what is known at the time of its preparation and what is assumed. Much of the base case uses the data gathered and the accounting and finance concepts discussed earlier.

3/Base case: the collected facts and assumptions about what is proposed, especially in regard to time, money and resources; that is, approvals, schedule, initial costs, revenues, ongoing expenses, people and equipment needed, and sources of funding. Use Sample Proposal Information ...

4/ There is no more important part of proposal preparation and presentation than knowing what to ask for: The Request. It is on the basis of a careful assessment of all the steps that must be implemented (How?) combined with the most realistic picture possible (base case) that both what is missing and what is needed for success can be shown. It is not enough to simply look for “money” or other resources as many ill-prepared project proponents do.

Among the categories of resources that might be missing may be found items such as:

- Funding or technical assistance to complete planning
- Seed capital to test or roll out part of what is proposed
- Partners to complete the team
- Advisors and experts to assist with critical tasks
- Systems and staff to manage implementation
- Financing for construction in the form of loans and equity investment<sup>4</sup>

Placing the request in its proper time frame is important to narrowing the search for resources that can fill the request. Asking a government-sponsored laboratory for construction financing is a waste of time for both parties involved.

5/ What If? Analysis is also called Sensitivity analysis -- What If things do not go as planned? This question tests the planning assumptions and describes outcomes and impacts that may differ from what is expected.

First of all, what can go wrong? After making a list, the probability of each event and its impact on the previously described inventory of benefits must be examined. What is the impact of differences in time: what if things take longer periods of time to be completed or are completed more quickly than planned? What about money differences: what if things cost more (or less) or revenue units are higher or lower than planned? And, what about output: what if the number of units of things produced or consumed is higher or lower than planned?

Then there are combinations of events: what if it takes longer and costs more to get something ready for operations and fewer units are produced than originally planned?

- Time events: if things take more or less time than planned
- Cost and revenue events: if things cost more or less than planned or if revenues are greater or less than planned in the base case
- Performance events: if what is planned does not produce the production originally expected
- Other events: such as the death of the proposal’s Champion, or severe weather such as a hurricane or drought

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<sup>4</sup> Loans are made based on the ability of the proposal to repay what is borrowed under clearly defined terms. Equity investments are made in return for a share of the profits upon the success of what is proposed.

Sensitivity analysis is the foundation of what is called “risk management”. We all believe that events will roll out as planned and we all know that such is rarely the case. Not only the Champion but all the other participants want to know “What If” this or that happens.

6/ To Whom is the proposal addressed? This is concerned with the target audience for whom a proposal is prepared. It concentrates on *their* expectations, *their* needs and, *their* processes for considering, approving and disbursing resources requested in a proposal.

The spectrum of enabling organizations – organizations that can provide funding and services – is quite well defined. It ranges from the purely charitable to the purely commercial. At one end of the spectrum one finds charitable foundations and individual donors. At the other one finds high-return venture capital funds and investors. Few if any proposals appeal to all the organizations and individuals along this spectrum. Research on the general and specific needs of each is a crucial investment of time during the proposal preparation process. The following description is simplified but not oversimplified. It represents general principles and experience to guide Champions as searches are conducted.

7/ The colours of money – Financial inputs for proposals fundamentally come in four different “colours”: revenues for products and services, including operating subsidies; grants that do not need to be repaid; loans that need to be repaid on defined terms; and equity, which is repaid from the profits, if any, from a proposal.

Revenues are the payments made by end users and others on their behalf (e.g., a government-sponsored subsidy programme is a revenue in the form of an operating subsidy).

Grants come from donors: charitable foundations, government-sponsored programmes (including multilateral development organizations and specialized programmes) and other specialized organizations.

Loans come from lenders: government-sponsored development institutions and banks, some charitable foundations, socially responsible and specialized investment funds and from commercial banks.

Equity comes from investors: owners of businesses or sponsors of social programmes, government-sponsored investment organizations, socially responsible and specialized investment funds, individuals and financial institutions.

8/Generally speaking – and there are many exceptions – a technology transfer proposal must explore and consider all four types of funding for a variety of needs.

- Revenues are the most logical funding source, first to cover the cost of the product or services provided and, second, to contribute to the operation of the company or programme providing the product or service. Ideally, there will be funds left over to be applied to any loans that have been made and to make a payment (called a dividend) to the providers of equity. This is sometimes called a



- “waterfall”, where monies received are first applied to the cost of the product or service provided (called “cost of goods sold”), second to other operating expenses (these would include taxes, for example, and any interest on loans); third, to loan payments (such payments are called “principal” or “amortization”, while the combination of principal and interest on loans is called “debt service”).
- ☑ Operating grants are a logical addition to revenues when revenues from customers cannot cover the cost of goods and services and there is a compelling social, environmental or other reason to provide this good or service to this customer or client group. Operating grants can come from government-sponsored programmes and charitable foundations.
  - ☑ Capital grants are used to reduce the cost of a proposal so that loans and equity can cover the balance. Capital grants often reflect a larger set of issues: to make a product or service affordable to customers by lowering the initial cost or to offset an unfair cost disadvantage in one technology versus another or to defray one-time costs of introducing a technology that has important advantages over time.
  - ☑ Loans are made to fund the construction of a project or the purchase of goods or the provision of services where the revenues from the goods or services are expected to be more than sufficient to repay the loans as and when promised. Some lenders are flexible in their loans for a variety of reasons. Others are absolutely not.
  - ☑ Equity is also called risk capital and, in some situations, venture capital. Providers of equity – also called “investors” to differentiate them from “lenders” of loans and “donors” of grants – are repaid only if a proposal is successful and profitable.

NOTE- There are a few other ways to finance projects, goods and services but these, upon examination, are actually revenues or grants, loans or equity. Leasing, build, own, operate and transfer (BOOT) contracts and instalment sales or purchases (hire purchase) are loans dressed up in more complicated clothes. So are financing or credit terms from a supplier. Mezzanine debt, preferred shares, quasi-debt and quasi-equity are combinations of loans and equity. Monetization (converting to cash) and sale of carbon credits or pollution benefits are revenues from different customers for the same basic product or service being offered.

9/ Champions and Enablers alike must (1) avoid being dazzled by financial engineering jargon; (2) understand the different “colours” of money; and (3) master the various returns that customers, donors, lenders and investors are seeking.

This latter point is important. When you calculate the cash incoming and outgoing amounts over a period of time it is possible to determine something called a project or proposal rate of return. This is a very rough but important indicator of two things: the proposal’s financial feasibility (a negative rate of return means there is more outgoing cash than incoming and it will run out of money at some point in time without additional resources) and the audience which might be interested. Negative and near zero returns require grants and subsidies. Returns above 0 per cent to between 5 and 7 per cent must

be examined from the standpoint of both donors and investors who consider social and environmental returns as well as financial ones. Above 5–7 per cent a proposal becomes more and more attractive to larger segments of the private sector (some would argue that 10 per cent is the cross-over point but a lower threshold does not signify lack of interest, merely that the proposal should be examined as requiring a combination of debt and equity and other funding). To be comfortable categorizing a proposal as private-sector-oriented, a “double digit” return is generally needed.

10/ Customization- Some features of even a well thought out “triple-bottom-line” proposal – one that combines development, environment and financial returns – may require greater emphasis for particular audiences. These customizations will be addressed in more detail in later sessions but are introduced here to begin us thinking about our different audiences and their needs.

Logical frameworks are statements of the larger context into which a proposal may fit. These are often important to charitable and social change organizations, and can be helpful in placing a proposal in the “larger world” that may underpin decisions by such organizations.

Carbon benefits can sometimes be monetized – converted to cash – but this requires understanding special processes. The core concepts to understand can be called “baseline”, “incremental benefit” and “value”.

Loans require an understanding of the requirements and process of lenders. Metrics such as debt service coverage ratios and clear descriptions of collateral and guarantees<sup>5</sup> advance discussions regarding loans.

Return on equity is a key indicator for certain private sector investors and a clear presentation of this will determine how much attention some commercial investors will give a proposal. This is simply a measure of the cash flow that remains after all other participants in the proposal have been paid as agreed and after all agreed-to amounts have been set aside for future purposes. When financial experts talk about the bottom line this is usually the line they are referring to.

#### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**

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<sup>5</sup> Binding promises to pay or turn over particular property under certain conditions.

**What I might do differently when teaching this material:**

## Session Five – What and Where? Product, Service, Technology and Clients ... Market and Setting

### Session 5 What? And Where?

- Information Content: the different dimensions of defining product, service, technology, clients, market and setting
- Technique Content: use of templates
- Exercise: by teams, investigate the “What?” and the “Where?” of one sample proposal, record “Notes and Comments” to be shared with other teams and proposal authors

Organizing Principle: *“There are lots of good ideas and there are many capable people; but for a good idea to work in the hands of capable people it must be the right ideas in the right place at the right time.”*

Session Objectives-to identify the key elements that must be identified, understood and described in a well-prepared and presented proposal ... to set forth the required data needed to accurately present a picture of the market, business, governing and civil society conditions that will underpin the success or failure of a proposal

Information Content – what comprises a good description of products, etcetera, and the introduction of our sample proposals

Technique Content – use of templates

Structure- Lecture plus Hands-on Exercise

Exercises – inputs to templates

Reference Materials – What and Where Templates

#### Trainer Notes

1/ In this session we begin the intersection of the question method and the templates, either printed or in spreadsheet form. This session can be well described by a series of “tough” questions:

*Why is this product the correct one to offer to these customers? Why choose this technology? What makes us think we can succeed with these customers, this technology, this product offering here? What are the laws, regulations and local conditions that must be observed? What permits must be obtained and from whom? What formal and informal approvals and permissions must be obtained in advance and observed throughout the period of operation? What products and services are used now? Why would customers*

*switch to the proposed product or service? Who else offers products and services that these customers might use? Why would they choose the proposed product or service?*

2/ Describing the concept (answering the question “What?”) – keeping the technology, service, product and client description factual and clear – involves describing three different things:

- Describe the product or service
- Describe the technology
- Describe the client group or customers

3/ Product and service description

- Description: Water or cooking fuel and heat or lighting are products. So is electricity sold to an electrical utility, and so are drought-resistant sweet sorghum varieties. By way of contrast, biogas produced from poultry litter mixed with water in a fixed-drum, below-ground digester, run through an adapted diesel generating set to produce electricity to power a pump to transport water to a tank for gravity-fed on-demand water distribution to a village is not a product or a service. It is a technology.
- The need being satisfied: Clean water at the household satisfies convenience, health and labour needs and avoids a variety of inconveniences, and also unhealthy, time-consuming chores.
- New product, new market or both? Has this been done before? Has it been done in a market like this market?
- Testing of product or service in the proposal’s market: It is expected to be accepted as a new or replacement product or service because... FILL IN THE BLANK!

4/ Technology description

- Description: How it works in clear, non-technical terms, combined with references for further information. An eight-page technology description in a 12-page proposal is not a good sign.
- Experience of and with the technology: Global, country, immediate market and Champion, installation, operations and maintenance.
- Testing of technology in proposal’s market.
- Components.
- Source(s) of inputs and outputs.
- Various sizes, approximate cost and approximate price to customers.
- Alternative sources (plan B).
- Determination that price is transparent and competitive.
- Maintenance requirements.
- Other technologies delivering similar products or services.

5/ Description of client group or customers

- Types of customers and clients targeted
- Approximate number of customers (current and next three years)
- Customers’ income and fluctuations in it
- Current product or service being used

- Why customers will use the new product or service
- How customers will be reached

6/ Note: If the proposal involves revenue from one large or a few customers (such as a utility or municipality), then the “health” of that customer needs to be examined:

- Core business performance of large customer (just because it is big does not mean that it is sustainable and competitive)
- Credit rating and track record of paying bills
- If the customer fails, what are the options?

#### 7/ Competitors

- Other companies or programmes targeting these customers
- Similarities between those competitors and this proposal
- Differences between those competitors and this proposal
- Why customers will choose the proposed new product or service

Note: Competitors include all activities, whether charitable or for profit, where the activities touch even lightly on the product or service being proposed. For non-profit activities, competitors also include any programmes competing for the same source of funding.

8/ Having described “What” we proceed to address “where?” What we want to do is describe the setting in a balanced and transparent manner to show that the local setting is understood

- Describe the general location and the conditions in the country or region
- Describe the market
- Describe the rules that govern operation and the approvals needed

#### 9/ Description of market setting

- Size
- Population
- Per capita GDP
- Income distribution
- Exchange rate
- Inflation rates (three years)
- Interest rate for deposits
- Interest rates for bank loans

#### 10/ Description of regulatory setting

- Permits needed to start a business
- Non-governmental organization permits needed
- Permits needed to study a project or undertake a feasibility study
- Permits needed to obtain a concession
- Permits needed to use a natural resource
- Permits needed to use roads or cross public lands
- Environmental permits and processes
- Construction permits
- Operating permits

- Applicable taxes and regulations

#### 11/ Description of operating setting

- Obtaining land or premises
- Security and corruption
- Hiring and firing
- Getting loans
- Contractors
- Transport
- Contract enforceability
- Interaction with inspectors and other public officials

#### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Six – Who and How? Team and Plan

### Session 6 Who? and How?

- Information Content: the variety of human and institutional skills and motivations to be considered in creating an implementation teams and a plan
- Technique content: use of templates to build such an inventory
- Exercise: teams switch proposals and prepare an assessment of the team and the plan, creating a series of questions and notes to be shared with other teams and the proposal author

Session Objectives-to set forth what constitutes a reasonably complete and balanced inventory of the skills and human resources required for preparing, presenting and implementing a successful proposal ... to convert the information thus far gathered into a clearly articulated plan of action with time and resource boundaries

Organizing Principle-“Rarely do things go as planned; people make the course corrections that decides success or failure.”

Information Content-the skill sets and experience needed

Technique Content-how to objectively decide what is needed and available, whether you are a Champion or an Enabler ... different ways to fill gaps.

Structure-Lecture, using a sample proposal for data entry, and Exercise, followed by discussion and feedback

Exercise - recognizing needed skills and skill gaps...recognizing the completeness (or not) of information from the planning, construction / pre-operation and operating perspectives.

Reference Materials-Who and How Templates

Discussion and Feedback: how difficult or easy is this exercise and the supporting lecture? For non-financial proposal preparers or reviewers it is important that their comfort level be assured; working in a team setting can do that, allowing the instructor to circulate among the various teams and provide guidance. Being able to print the final result (after How? Template Step 5) could be a satisfying training outcome for newcomers to financial information.



## Trainer Notes

1/ The Importance of Champion and Team Assessment cannot be overstressed. A Champion is willing to invest his or her money, time and reputation to turn a viable core idea into a successful enterprise and a full-time opportunity. Early in the relationship, an enabling organization needs to have a tangible sense as to the money, asset and time commitment of the entrepreneur. Champions need help, especially easy-to-use guidance that responds to the needs of enabling organizations. Further, Champions need information to access, particularly with respect to sources of funding and other support. Providing active assistance and support entails a three–five-year “marriage” with a Champion that has much against it. Enablers need to choose the right Champion and vice versa. At the same time, do not let personal preferences cloud judgments. The “right partner” is a good *business* partner, though he or she might not be someone with whom you want to share a social meal. And we need to be careful of Champions who come to business sectors via politically connected entry points and without experience.

There are many good ideas, and for every good idea that is successfully implemented, there are hundreds that never go forward. And while there are many ingredients that need to come together for a good idea to translate to successful implementation, the most important ingredient is the Champion: that individual or small group committed to the idea. However, **more than commitment is needed**. Before beginning the serious work of preparing a proposal, its Champion needs to undertake a rigorous inventory of two things: motivation and capabilities.

**2/ Motivation:** what are the underlying reasons why the Champion is committing his or her time, money and reputation to this proposal? Is it about an amount of money (income or wealth creation)? About building a track record and experience base? About social or environmental change? Or for a combination of these things or other reasons?

Is the commitment serious, meaning full-time involvement (few Champions engage part-time)? Is there a match (or a mismatch) between the objectives of the Champion and the likely outcome of the proposal’s success? (If the Champion wishes to build some wealth in five years, creating even a successful household energy programme in poor rural communities is probably not the way to do so.) The first order of business is for the Champion to take inventory of his or her or the team’s motives:

- Regular income
- Wealth creation
- Permanent organization
- Gain experience
- Social improvement
- Environmental improvement
- Other

3/ The second order of business is to determine, honestly and openly, whether these motivations are consistent with the proposal being prepared or if there is a mismatch. Proposals are difficult enough to implement without having a conflict between the Champion’s motivation and the work in hand.

**Capabilities:** having the will and the motivation is not enough (being ready to do something is not the same as being ready and prepared). Enabling organizations will look closely at the skill set and experience base presented in a proposal. The greatest engineering design capability must be balanced with many other skills, and the financial wizard needs to possess and demonstrate planning and implementation skills. Most proposals require a mix of skills, including:

- Day-to-day operations and management
- Financial planning
- Legal and regulatory matters
- Negotiations
- Bank and investor relations
- Design
- Engineering
- Procurement and purchasing
- Construction
- Operations and maintenance
- Sales and marketing
- Reporting, monitoring and evaluation

What the Champion possesses needs to be honestly evaluated. What are weak or missing needs should be balanced by additions to the team or be clearly identified as gaps to be filled (and budgeted for!). These additions can come from other owner-investors, employees or contractors. The finished picture, however, should show the requisite expertise across a number of disciplines:

- Technical
- Operational
- Financial
- Legal
- Sales and service
- Marketing
- Political
- Fund-raising

4/ It is quite easy and natural to overrate what we each bring to a proposal; investors, donors and lenders can be convinced sometimes. However, the reality will be much harsher during implementation. An honest self- and team assessment may result in a more costly proposal. It may even result in a proposal that is not feasible. Nevertheless, having a smaller project or an infeasible proposal is quite a bit easier on the Champion than having an approved, under-resourced proposal that fails in the field.

5/ Introducing the team (answering the question “Who?”) – evaluating and presenting the team and the stakeholders; showing who will be involved

- Describe the Champion and evaluate his or her strengths, weaknesses and motivation.
- Describe the owners or sponsors, what they are bringing, the level of their commitments and their motivation.

- ☑ Describe the employees, staff and advisors who will be involved and match the assembled skill set of the Champion, owners, employees, staff and advisors against a list of the skills required for the proposal's implementation.
- ☑ Show how the plan will be organized at its various stages. This is an important juncture for being clear about the schedule and timing of what is proposed.
- ☑ Describe all the formal and informal parties who will be involved, including different levels of civil society and government. Start thinking about all the things that others might do to disrupt what is planned, for personal or political gain.

Questions: What are the shortcomings of the team? What skill sets and experience are missing? How will this be managed? What are the roadblocks that others can put in the way of getting the plan implemented? What will it mean? How can this potential roadblock be avoided?

#### Team skills and objectives

##### Champion's objectives:

- Regular income
- Wealth creation
- Permanent organization
- Gain experience
- Social improvement
- Environmental improvement
- Other

##### Champion's skills and experience base:

- Marketing and sales
- Day-to-day operations and management
- Financial planning
- Legal and regulatory matters
- Negotiations
- Bank and investor relations
- Design
- Engineering
- Procurement and purchasing
- Construction
- Reporting, monitoring and evaluation

##### Team skills and experience base:

- Technical
- Operational
- Financial
- Legal
- Sales and service
- Marketing
- Political
- Fund-raising

## Participants

Company or organization making the proposal:

- Name
- Legal address
- Legal status
- Owners and percentage of ownership
- Managing Director
- Technical head
- Finance head
- Board of Directors
- Bank account
- Accountants
- Lawyers
- Brief history

Organizations or companies offering similar products or services:

- Organization
  - Product or service
  - Similarities
  - Differences
- Repeat as needed

Organizations supplying raw materials or products:

- Organization
  - Raw material or product supplied
  - Status of contract
- Repeat as needed

Organizations supplying specialized services (and their credentials)

- Design
  - Construction
  - Technical analysis
  - Financial advice
  - Legal
  - Carbon benefit
  - Other
- Repeat as needed

Landowners selling or leasing or giving permission to use land or grant access:

- Parcel of land (location, description)
  - Landlord
  - Status of contract
- Repeat as needed

6/ Explaining the plan (answering the question “How?”) – organizing and presenting the steps to implementation: How will the core idea be turned into an operating reality?

- ☑ Describe the proposal in terms of blocks of time (“To finish planning” “To reach financial closure” “To build” “To commence operations”). Under each block of time itemize the subtasks that need to be accomplished and the approvals that need to be obtained. Add for each subtask an estimate of the cost and revenues.
- ☑ Sketch out how the proposal will be managed (organization chart or organigram).

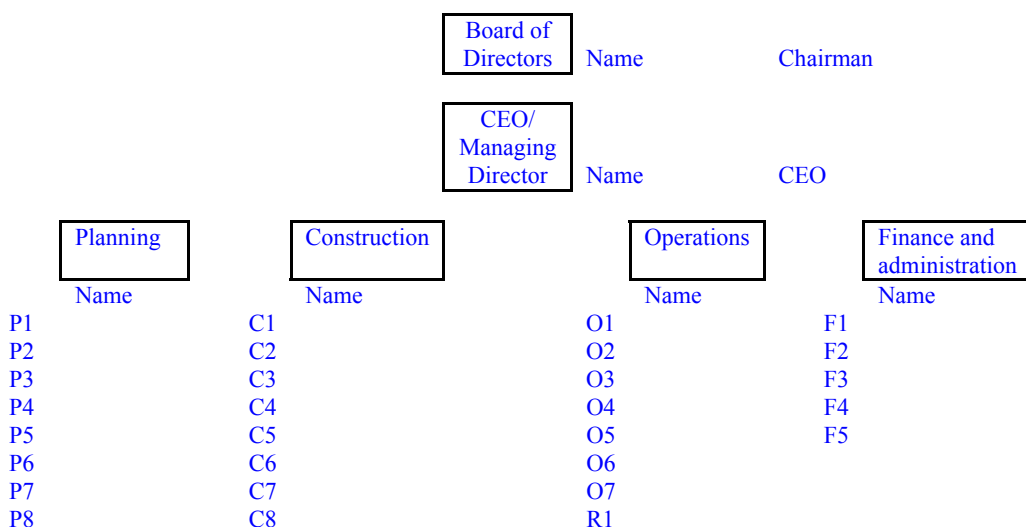
*Questions:* Is everything included? Do all critical tasks fit within identifiable blocks of time? What are the critical items that can bring the plan to a halt? Have cost and other resource estimates been prepared for each *and all* of the tasks? Are there details for just the construction or roll-out phase or have the operational tasks been planned for the entire life of the project? Are there different staffing plans for the different phases? How are these reflected in estimates? How will the technology, product, service or facility be built or acquired? What are the sources of equipment, raw materials and labour? Is there a clear division of labour and accountability during each phase?

The following table – which summarizes the Planning, Construction and Operating Tasks -- is the first building block of a Plan and a crucial test of the completeness of thinking and fact-finding by a Champion:

	Planning tasks	Responsible person	Estimated cost	Month	
				Start	Finish
P1	Permits	Name	15,000	1	12
P2	Technical analysis I	Name	10,000	1	12
P3	Contracts I	Name	5,000	1	12
P4	Contracts II	Name	10,000	13	24
P5	Technical analysis II	Name	5,000	13	24
P6					
P7					
P8					
P9					
P10					
			45,000		

				Month	Number
	Construction tasks	Responsible person	Estimated cost		
C1	Land acquisition	Name	240,000	6	12
C2	Engineering	Name	110,000	6	12
C3	Machinery 1	Name	2,381	6	12
C4	Machinery 2	Name	200,000	13	24
C5	Machinery 3	Name	111,000	13	24
C6	Machinery 4	Name	22,333	13	24
C7	Testing 1	Name	300,000	25	36
C8	Testing 2	Name	33,334	25	36
C9					
C10	Interest during construction	Name	50,952	6	36
			1,070,000		
	Revenue & operations tasks	Responsible person			
	Open for business	Name			37
R1	First year revenue	Name	AMOUNT	37	48
R2	Second year revenue	Name	AMOUNT	49	60
O1	First year labour – payroll	Name	AMOUNT	37	48
O2	First year rent	Name	AMOUNT	37	48
O3	First year materials	Name	AMOUNT	37	48
O4	First year general administration	Name	AMOUNT	37	48
O5					
O6					
O7					
	Finance and administration	Responsible person			
F1	Financial closing	Name		Date	12
F2	Accounting manual & system 1	Name		6	12
F3	Accounting manual & system 2	Name		13	36
F4	Report to investors/ lenders 1	Name			15

What follows – and grows from the preceding list – is a simplified organization chart that focuses on relating people to responsibilities in one place. It also serves (later) as a template for preparing job descriptions.



P9  
P10

C9  
C10

R2  
R3

Done properly, most all the information needed to complete financial planning is now at the Champion's fingertips.

**Session Feedback Notes**

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Seven - Why? Benefits and Impacts

### Session 7

#### Why? impacts and benefits

- Information Content: classifying the type of project from an environmental perspective and creating an inventory of the benefits offered by a proposal
- Technique Content: recognizing project differences and impacts, thinking beyond conventional classifications to realize the maximum “triple bottom line”
- Exercise: with authors joining the proposal teams the notes, comments and questions thus far will be reviewed and the impacts and benefits of the projects discussed.

Session Objectives-to introduce a commonly framework for classifying proposals ... to create an inventory of strengths and weaknesses, benefits and negative impacts requiring attention

Information Content-Type A, B and C definitions and excluded projects

Technique Content-minimal other than recognizing the differences between classifications and among projects

Structure-Lecture with Examples followed by exercise, followed by discussion: is this an important part of the training? Why?

Exercises-Five or six project one-three paragraph descriptions with classifications prepared by teams

Questions-What do these classification tell us regarding projects? Is there a good versus a bad classification?

Reference Materials-World Bank IFC Guidelines, Equator Principles ... Why? Template

#### Trainer Notes

1/ Not all projects or proposals are created equal. Some are destined to disturb the environmental and social status quo quite a bit. Some, less so. And some will have significant impacts – both positive and negative.

A classification system of sorts has been adopted by organizations, especially multilateral development and commercial banks, which tries to create broad categories of projects.

It is important for Champions to understand these categories both because of the work involved and the ease or difficulty of obtaining approvals and financing.

**2/ Category A → Projects with significant impacts --** a proposal is classified as category A if it is likely to have significant adverse environmental impacts that are



sensitive,<sup>6</sup> diverse or unprecedented. These investments may affect an area broader than the sites or facilities proposed by the Champion. An environmental assessment for a category A investment examines the potential positive and negative impacts, compares them with those of feasible alternatives (including the “without project” scenario), and recommends the measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve performance. A full environmental assessment is required, which is normally called an environmental impact assessment (EIA).

<b>Typical category A projects</b>	
Projects affecting indigenous people	Construction of dams and reservoirs
Projects involving resettlement of communities/families	Pesticides and herbicides: production or commercial use
All projects which pose serious socioeconomic concerns	Major irrigation projects or other projects affecting water supply in a given region
Projects associated with induced development (e.g., inward migration)	Domestic or hazardous waste disposal operations
Projects which impact on cultural property (e.g., religious and archaeological sites)	Hazardous chemicals: manufacture, storage or transportation above a threshold volume.
Projects which pose serious occupational or health risks	Oil and gas developments, including pipeline construction
Impacts on protected natural habitats or areas of high biological diversity, including wetlands, coral reefs and mangroves	Large infrastructure projects, including development of ports and harbours, airports, roads, rail and mass transit systems
Forestry operations (commercial logging operations or logging in primary humid tropical forests)	Metal smelting, refining and foundry operations
Large thermal and hydropower developments	Mining (opencast and pit)
Large-scale industrial plants and estates	International waterways
Use of chlorofluorocarbons (CFCs) or other ozone-depleting substances	Hazardous materials, air pollution, noise or odours

**3/ Category B → Projects with impacts --** projects are classified as category B if their potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – are **less adverse than those of category A. Impacts are site-specific**; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for category A projects.

The scope of an **environmental assessment for a category B investment may vary** from project to project, but it is narrower than that of an environmental assessment for category A, but, like a category A environmental assessment, it examines the potential

<sup>6</sup> A potential impact is considered “sensitive” if it may be irreversible (e.g., lead to loss of a major natural habitat), affect vulnerable groups of ethnic minorities, involve involuntary displacement and resettlement, or affect significant cultural heritage sites.

positive and negative impacts and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance.

A wide range of environmental guidelines have been developed by local or country authorities, and also by a number of organizations, including the World Bank Group (e.g., *Pollution Prevention and Abatement Handbook*, *Occupational Health and Safety Guidelines*), to clarify the category of a project and its appropriate handling.

<b>Typical category B projects</b>	
Specific waste disposal issues	Solar photovoltaic (if batteries used)
Waste handling	Biomass/biogas
Routing, partially storing river flows	Small to medium-sized hydroelectricity projects

**4/ Category C → Projects with no or minimal impacts** -- a proposed investment is classified as category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening (documenting), no further action is required for a category C project.

<b>Typical category C projects</b>	
Pre-feasibility study preparation	Energy efficiency
Consulting firms	Share registries
Service industries	Stock broking
Technical assistance	Retail banking

**5/ Exclusions** -- of course, there are activities with the clear potential to pose unacceptable social and environmental risks that tend to be “unclassified” as A, B or C. Examples of projects to be avoided include:

- Production or activities involving harmful or exploitative forms of child labour
  - Production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements
  - Production of or trade in weapons and munitions
  - Production of or trade in alcoholic beverages (excluding beer and wine)
  - Production of or trade in tobacco
  - Gambling casinos and equivalent enterprises
  - Trade in wildlife or wildlife products regulated under Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
  - Production of or trade in radioactive materials
  - Production of or trade in or use of unbonded asbestos fibres
  - Commercial logging operations in primary humid tropical forest
  - Production of or trade in products containing polychlorinated biphenyls (PCBs)
  - Production of or trade in pharmaceuticals subject to phase-outs or bans
  - Production of or trade in ozone-depleting substances subject to phase-out
- Drift-net fishing in the marine environment using nets in excess of 2 km in length

6/ Describing the benefits and impacts (answering the question “Why?”) – estimating and preparing the impacts, outcomes and expectations of the proposal: itemizing benefits, creating a matrix of benefits, and inventorying proposal impacts and mitigation measures.

Estimate and describe all benefits. Establish impacts and conditions to monitor.

Identify and describe all environmental and social impacts and measures to mitigate negative impacts.

*Question:* Have all the financial, social, environmental, emotional, market growth and replicability benefits and impacts been investigated?

7/ There are just a few parts of the process that require sitting back and thinking outside the confines of the evolving plan. This is one of those. Proposals tend to begin and evolve around a core idea or two, but often there are many other benefits. Not only that, there are potential impacts that need to be understood earlier rather than later. A proposal to build a hydroelectric facility can begin with a renewable energy focus, but there are construction job, operating job, land reclamation, rural development, greenhouse gas, reforestation and market development possibilities. Champions tend to be driven by their core objectives and that is a very good thing because focus gets things done. It is not suggested that side activities should be added to core ones for the sake of gathering up additional benefits. What is suggested here, however, is to make a careful appraisal of all the impacts, positive and negative that might occur because it is essential to understand them as they may prove important to others. Donors, lenders and investors are all conscious of these issues, so a complete assessment and an understanding of the language (the language of category A, category B and category C projects as described in chapter 2) will make a proposal more balanced and complete. Thus, make sure to count all the potential benefits of the proposal and make sure to account for all its potential social and environmental consequences.

8/ Itemize benefits, such as:

- Introduction of new technology, construction and operating skills and jobs
- Income value of new jobs
- Indirect income benefits
- Land area improved – soil, vegetation, water, appearance
- Number of new seedlings and trees
- Improved public areas and infrastructure (linear feet of road or hectares of land)
- Clean water (litres)
- Sustainable fuel (kg of oil equivalent)
- Total funding mobilized
- Public utilities (electricity, water) supplied
- Educational and informational activities

9/ Special benefits for “strategic” investor or donor

What follows is a short but potentially important subtask depending on whether a specific type of investor (strategic investor) has an interest in a proposal. The Champion should

identify any special knowledge, infrastructure, experience or reputation benefit that the proposal might offer to a special type of investor: one who wants to learn and gain experience or “test the water” but would rather do so through someone else.

Will the proposal *create* groundbreaking policy changes that could open the market to others?

Will the proposal *offer information and experience* at a fraction of the cost of someone new gathering the information directly?

Will the proposal *teach skills* that will allow others to expand if they had those skills and that experience?

10 / Itemize potential impacts:

#### Category A

A proposal is classified as category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented.

Projects that require particular attention include:

- Dams and reservoirs
- Large-scale industrial plants and estates
- Major oil and gas developments, including major pipelines
- Large thermal and hydropower developments
- Domestic and hazardous waste disposal operations
- Pest management (significant use of man-made pesticides/agrochemicals)
- Properties occupied by indigenous peoples or containing cultural heritage sites or critical natural habitats
- Locations requiring the involuntary loss of land, housing or livelihoods by occupants
- Forests (commercial logging operations or logging in primary humid tropical forests)
- International waterways
- Hazardous materials, air pollution, noise or odours
- Use of chlorofluorocarbons (CFCs) or other ozone-depleting substances

#### Category B

Projects are classified as category B if their potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – are less adverse than those of category A. Impacts are in this case site-specific; few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

#### Category C

A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening (documenting), no further action is required for a category C project.

11/ Champions need to think outside the proverbial box to identify all the positive benefits of the proposal. At the same time, Champions need to anticipate the wide variety

of impacts which the proposal can have (others certainly will!) and deal with them sooner rather than later. The EXERCISE here needs to use the identification of possible impacts as a lesson in also identifying potential benefits.

## WHY Template

### Financial Returns

Why will the proposal be profitable?

- Strong Demand       Urgent Need       Lack of Alternatives  
 Government Incentives       Other

If 'Other' was chosen above, please expand

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Have other projects / enterprises tried to be profitable in serving this market?

- Yes       No       Unknown

If Yes - Have these failed? Why?

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Why is your proposal different?

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Why do you expect to succeed?

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What resources - services and funding - do you think are essential to your success?

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What amount of equity do you have or project to have in your enterprise?

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What amount of third-party equity from partners/associates do you have or project to have?

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What amount of third-party leverage do you need from a financial institution?

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**What kind of funding do you need?**

- Loan                       Investment

**From what kind of institution?**

- Commercial Bank             Government-sponsored development institutions and banks
- Charitable foundations     Socially responsible investment fund             Venture Capital

**What is the projected interest rate range that can be paid to a lender?**

- 0% - 3%                       4% - 8%                       8% - 12%                       Greater than 12%

**What are the projected investment terms (i.e. length of time for loan or investment)?**

- Less than 1 year             1 - 2.99 years             3 - 5.99 years             Over 6 years

**What is the projected Internal Rate of Return?**

- Less than 5%                       5% - 9.99%                       10% - 14.99%                       Greater than 15%

**What is the projected growth in net assets over the investment term?**

- Less than 5%                       5% - 9.99%                       10% - 14.99%                       Greater than 15%

**Has this proposal received any grants/subsidies?**

- Yes                       No                       If Yes - How Much \_\_\_\_\_

**Is this proposal expected to receive any grants/subsidies?**

- Yes                       No                       If Yes - How Much \_\_\_\_\_

**If Yes - Who provided (or is expected to provide) the grants and/or subsidies?**

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**Will audited financial statements be available for review on an annual basis?**

- Yes                       No

**If No - Why not?**

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**If No - What kind of financial statements will be available for annual review**

- Internal Statements     Notice-to-Reader     Review Engagement     Not available

**Indicate the size of the group who will reap financial benefits from this proposal**

- Individual     Small Group     Community/Region     Country

**Provide an indication as to the length of time anticipated before profits are realized**

- Immediately     1-3 Years     4-6 Years     6+ Years

**Why would customers choose the product and/or service over those currently available?**

- New     Improvement     Lower Cost     Better Quality

**Discuss potential negative financial impacts from your proposal that could offset some of the benefits discussed above**

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## Social and Development Impacts

**With respect to your proposal, check all of the following social/development impacts that are applicable for your country/region**

- Better Health     Quality of Life     Education     Job Creation
- Jobs for Women     Eliminate Child Labor     Income Generation     Access/Water Quality
- Saves Time     Better Food Production     Energy Efficiency     Other

**Definitions:**

Better health	Less smoke, more light; better ventilation, sanitation and waste disposal
Quality of Life	Level of well-being i.e. access to electricity for home/store/community center
Education	Increased income to finance formal education or electricity for school
Job Creation	Creation of more or better gainful employment opportunities
Jobs for Women	Creation of gainful employment opportunities specifically for women
Eliminate Child Labor	Improvement in productivity that ensures child labor not needed; time for education
Income Generation	Stimulation of economic development in the region through energy services
Access/Water Quality	Better access to water; higher quality of water
Saves Time	Higher productivity through energy services; more free time available
Better food production	Improved food production through safe food storage, lighting, etc.
Energy efficiency	Same level of end-use services (ex: lighting, heating) with less electricity or lower economic costs and environmental impacts

If 'Other' was chosen above, please expand

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Explain which three of the above answers will have the highest positive impact

1) \_\_\_\_\_

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2) \_\_\_\_\_

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3) \_\_\_\_\_

**Projected amount of clean energy generated from this proposal (MWH) per year**

- Less than 1,000       1,000 - 10,000       10,000 - 50,000       Greater than 50,000

**Projected number of households served through this proposal per year**

- Less than 100       100 - 999       1,000 - 10,000       Greater than 10,000

**Projected number of people provided access to modern energy services through this proposal**

- Less than 100       100 - 999       1,000 - 25,000       Greater than 25,000

**In the direct new jobs created by your enterprise, how much will each employee earn per year?**

- Less than \$250       \$250 - \$500       \$500 - \$999       Greater than \$1,000

**Projected number of jobs created or sustained through this proposal**

- Less than 5       5 - 10       11 - 20       Greater than 50

**Provide an indication as to the timeline of the social/development impact of your proposal**

- Initial Impact Only       1 - 3 Year Impact       4 - 6 Year Impact       6+ Year Impact

**Why is this proposal important for your country/region?**

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**Discuss potential negative social/development impacts from your proposal that could offset some of the benefits discussed above**

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Why should your proposal be supported versus other proposals?

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## Environmental Benefits

Identify the positive Environmental Impacts your proposal will provide

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Access/Water Quality   | <input type="checkbox"/> Reforestation        | <input type="checkbox"/> Decreased Reliance on Fossil Fuels |
| <input type="checkbox"/> Improved Soil Quality  | <input type="checkbox"/> Reduced Emissions    | <input type="checkbox"/> Decreased Waste                    |
| <input type="checkbox"/> Less Landfill Material | <input type="checkbox"/> Greater Biodiversity | <input type="checkbox"/> Decreased reliance on basic fuels  |
| <input type="checkbox"/> Improved Air Quality   | <input type="checkbox"/> Energy Efficiency    | <input type="checkbox"/> Other                              |

**Definitions:**

Access/Water Quality	Better access to cleaner water
Reforestation	Planting or seeding an area where forest vegetation has been removed.
Fossil Fuels	Decreased usage of carbon-based energy sources: coal, oil, natural gas
Improved Soil Quality	Measures related to both productivity for crops and environmental factors
Reduced Emissions	The release of greenhouse gases into the atmosphere
Decreased Waste	Eliminates sawdust/biomass waste
Less Landfill Material	Using landfill gas as an alternative to conventional fuels
Greater Biodiversity	Lower environmental impacts to allow for greater number/variety of organisms
Basic fuels	Decreased usage of firewood, kerosene and charcoal
Improved Air Quality	Air status regarding the presence of pollutants a by-products of energy
Energy efficiency	Same level of end-use services (ex: lighting, heating) with less electricity or lower economic costs and environmental impacts

If 'Other' was chosen above, please expand

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---

Explain which three of the above answers will have the highest positive impact

- 1) \_\_\_\_\_
- 
- 2) \_\_\_\_\_
- 
- 3) \_\_\_\_\_
- 

Provide an indication as to the timeline of the environmental impact of your proposal

Initial Impact Only       1-3 Year Impact       4-6 Year Impact       6+ Year Impact

**Do you think your proposal will qualify for carbon credits?**

Yes       No       Unknown

**If Yes - please explain why and when you think your proposal will qualify for carbon credits**

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**Projected amount of CO2 offset per year (in tons)**

Less than 10       10 - 25       26 - 50       Greater than 50

**If No or Unknown - please explain why not**

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**Projected number of trees planted**

Less than 10       10 - 50       51 - 100       Greater than 100

**Projected number of liters of clean water generated (000's)**

Less than 2,500       2,500 - 4,999       5,000 - 7,499       Greater than 7,500

**Projected number of additional households with access to clean water**

Less than 100       100 - 999       1,000 - 10,000       Greater than 10,000

**Projected number of barrels of oil displaced**

Less than 2,500       2,500 - 4,999       5,000 - 7,499       Greater than 7,500

**Projected number of liters of kerosene displaced (000's)**

Less than 500       500 - 999       1,000 - 1,499       Greater than 1,500

**Projected amount of firewood displaced (kg) (000's)**

Less than 5,000       5,000 - 7,499       7,500 - 9,999       Greater than 10,000

**Projected amount of charcoal displaced (kg) (000's)**

Less than 5,000

5,000 - 7,499

7,500 - 9,999

Greater than 10,000

**Why do you feel your proposal will result in greater environmental benefits than those achieved from currently available products/services?**

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**Discuss potential negative environmental impacts from your proposal that could offset some of the benefits discussed above**

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**Session Feedback Notes**

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Eight - Building and Understanding the Base Case

### Session 8 – the base case

- Information Content-base case components
- Technique Content-template entry and use of default values and “basic assumptions”
- Exercise-teams and authors enter data and begin to compile a list of what could go wrong, filling in “default” assumptions where data is not available

Session Objectives-to convert what has been learned and assumed into a clearly articulated, quantitatively bounded presentation

Information Content- base case components

Technique Content – data classification and input

Structure-Lecture, which will be just an overview of what will then be done together, followed by the completion of templates as teams

Reference Materials - templates

Trainer Notes-

1/ Building the base case: Using a building-block approach begins with putting words and numbers in boxes and then running those numbers through a process that each of us can understand and duplicate.

Champions new to this process should go through each subtask until every one of the numbers is identified. Enablers should inventory this approach and determine how it does or does not fit into their own base case financial analysis. Once this flow is mastered it will seem natural.

Building the basic assumptions

Evaluating feasibility

Adding a financing plan

Testing

2/ Basic assumptions take two forms: The first is a narrative explanation of what is expected to occur. The second is the conversion of those assumptions into numbers that represent the costs and revenues explained.

	Planning costs	Year -2 months 1–12	Year -1 months 13–24	Year 0 months 25–36	Total
P1	Obtaining all permits	15,000			15,000
P2	Technical analysis	10,000			10,000
P3	Negotiating and preparing contracts	5,000			5,000

P4	Negotiating and preparing contracts		10,000		10,000
P5	Technical analysis		5,000		5,000
	<b>Total</b>	<b>30,000</b>	<b>15,000</b>	<b>0</b>	<b>45,000</b>

### 3/ Narrative description and conversion into numbers

- Planning costs will total 45,000, consisting of P1, P2, P3 and P4 etc., carried out in years -2 and -1<sup>7</sup> of the proposal as follows.
- Construction will occur over three years and total 1,070,000, comprising the following: C1, C2, C3, C4, etc. Prices are based on a lump-sum estimate with a 15 per cent contingency factor for unforeseen events.

	Construction /pre-operations costs		Year -2 months 1-12	Year -1 months 13-24	Year 0 months 25-36	Year 1 months 37-48	Year 2 months 49-60	Total
C1	Land acquisition		240,000					240,000
C2	Final engineering and design		110,000					110,000
C3	Machinery		2,381					2,381
C4	Machinery			200,000				200,000
C5	Machinery			111,000				111,000
C6	Machinery			22,333				22,333
C7	Testing				300,000			300,000
C8	Testing				33,333			33,333
	<b>Subtotal</b>		352,381	333,333	333,333			1,019,047
C9	Annual interest during construction	5%	17,619	16,667	16,667	0	0	50,952
	<b>Total</b>		<b>370,000</b>	<b>350,000</b>	<b>350,000</b>	<b>0</b>	<b>0</b>	<b>1,070,000</b>

- Full-year revenue equals 304,000 and may be reached after six months. For planning purposes it is assumed that full-year revenues will not occur until year 4 and years 1, 2 and 3 have been estimated at 140,000, 241,000 and 261,000 based on lower prices and production in year 1 and lower production in years 2 and 3. Revenues are expected to grow at the rate of inflation but are held constant throughout the proposal so as to be conservative.

	Revenues	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-15
	Units	400	550	650	700	700	700
	Revenue per unit	200	200	200	200	200	200
R1	<b>Revenue from 1</b>	80,000	110,000	130,000	140,000	140,000	140,000
	Units	300	520	520	670	670	670
	Revenue per unit	200	200	200	200	200	200
R2	<b>Revenue from 2</b>	60,000	104,000	104,000	134,000	134,000	134,000
	Units		180	180	200	200	200
	Revenue per unit		150	150	150	150	150
R3	<b>Revenue from 3</b>	0	27,000	27,000	30,000	30,000	30,000
	<b>Revenues</b>	<b>140,000</b>	<b>241,000</b>	<b>261,000</b>	<b>304,000</b>	<b>304,000</b>	<b>304,000</b>

- Operating costs include O1, O2, O3, O4, etc., and total a yearly average of 122,000, of which an average of 110,000 relates to direct costs and 12,000 relates to the cost of general administration. Operating costs are expected to grow at half the rate of inflation. Because revenue growth is not included and because it exceeds expected operating cost growth, operating costs for years 5-15 have been held constant.

<sup>7</sup> -2 and -1 equal “minus two” and “minus one”, meaning two years and one year before operations (product or service delivery) commences. THIS IS IMPORTANT INFORMATION CONTENT.

	<b>Operating costs</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Years 6–15</b>
O1	Labour	5,000	6,000	7,000	8,000	9,000	9,000
O2	Rent	50,000	50,000	50,000	50,000	50,000	50,000
O3	Communications	5,000	5,000	5,000	5,000	5,000	5,000
O4	Materials	50,000	50,000	50,000	50,000	50,000	50,000
	<b>Operating costs subtotal</b>	110,000	111,000	112,000	113,000	114,000	114,000
	General and administrative costs	12,000	12,000	12,000	12,000	12,000	12,000
	<b>Total</b>	<b>122,000</b>	<b>123,000</b>	<b>124,000</b>	<b>125,000</b>	<b>126,000</b>	<b>126,000</b>

- Grants totalling 62,500 will be received from NAME organization to reduce the capital cost and to cushion the first year of operation. IT IS IMPORTANT TO EMPHASIZE HERE THAT “BUSINESS TECHNIQUES” OF ANALYSIS APPLY EQUALLY VALIDLY TO CHARITABLE, PHILANTHROPIC AND SOCIAL-ENVIRONMENTAL PROPOSALS; IN GACT THESE TECHNIQUES ALLOW GRANT REQUIREMENTS TO BE ACCURATELY ESTIMATED AND PRESENTED.

	<b>Grants and subsidies</b>	<b>Year -2</b>	<b>Year -1</b>	<b>Year 0</b>	<b>Year 1</b>	<b>Year 2</b>
1	For planning or construction/pre-operation					
	NEW requests			25,000		
	Existing or other requested grants and subsidies			25,000		
2	For operation					
	For operation – existing or other requested				12,500	
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>50,000</b>	<b>12,500</b>	<b>0</b>

4/ This is a very straightforward, methodical process of placing all the financial inputs and outputs into their proper classification – planning, construction or operation – and placing these estimates into their appropriate time periods. If done carefully, this detailed but simple exercise serves as the foundation for what can sometimes seem to be complex calculations. In reality, the resulting calculations are nothing but the refinement and manipulation of the basic data prepared in tables such as the ones above.

5/ Feasibility analysis uses the basic assumption information to determine a rough project or proposal rate of return on a before-tax basis. It is simply a matter of posting the capital costs and the operating revenues and costs in their appropriate years. If dealing with a project proposal, then the time limit is set by the proposal. For enterprises or more open-ended proposals, 15 years is a good time frame for estimates. Net present value and internal rate of return techniques give a time value to money. Anything beyond 15 years tends to have very little impact on these.

Place planning, construction and operating results in their appropriate years (year 1 being the first year of operations, prior years being zero, minus one, minus two, etc.)

- For each year, total the amounts outgoing and incoming. Total capital costs are a minus because these are outflows; grants are a plus because these are inflows; operating cash flow is a combination of ins and outs
- For each year, total the cash flow (out equals minus; in equals positive)
- Calculate the internal rate of return
- Interpret results

Results	Total all years "undiscounted cash flow"									
		Year -2	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6–15
Planning costs	45,000	30,000	15,000							
Construction/ pre-operations costs	1,070,000	370,000	350,000	350,000						
Capital costs	<b>1,115,000</b>	<b>400,000</b>	<b>365,000</b>	<b>350,000</b>						
Grants and subsidies										
For planning , construction or pre-operation	50,000			50,000						
For operations	12,500				12,500					
Grants and subsidies	<b>62,500</b>			<b>50,000</b>	<b>12,500</b>					
Revenues	4,290,000				140,000	241,000	261,000	304,000	304,000	304,000
Operating costs	1,880,000				122,000	123,000	124,000	125,000	126,000	126,000
Net revenue from operations	2,410,000				18,000	118,000	137,000	179,000	178,000	178,000
Operating grant	12,500				12,500					
EBITDA <sup>8</sup>	<b>2,422,500</b>				<b>30,500</b>	<b>118,000</b>	<b>137,000</b>	<b>179,000</b>	<b>178,000</b>	<b>178,000</b>
Simple feasibility test using pre-tax IRR for 15 years	<b>10%</b>	<b>(400,000)</b>	<b>(365,000)</b>	<b>(300,000)</b>	<b>43,000</b>	<b>118,000</b>	<b>137,000</b>	<b>179,000</b>	<b>178,000</b>	<b>178,000</b>

#### 6/ How to interpret IRR:

- If negative, revenues and existing grants cannot cover the capital and the operating costs of the proposal. Without *additional revenues, grants or subsidy*, the proposal is probably not financially viable.
- If positive but below 5–7 per cent, the proposal is financially self-sustaining but may be of limited interest to the private sector. Specialized lenders, investors and donors who value development, environmental and market transformation impact may consider such a proposal.
- If positive and over 5–7 per cent, the proposal's financial details (especially tax implications, debt structure and any additional revenues) need to be developed further and different financing schemes considered; the result may or may not be of interest to the private sector. Specialized lenders, investors and donors who see the blended value potential of investments are likely to be targets.
- If over 10 per cent, the financial details need to be developed with a strong view towards engaging private-sector investors and lenders.

<sup>8</sup>

EBITDA = Earnings before interest, taxes, depreciation and amortization.

7/ A financing plan is an approximation of how much of a proposal's cost will be covered with its future revenues, divided between the "big three" sources of funding for launching proposals: grants from donors, loans from lenders and equity from owner-investors.

- Over its life (say 15 years), what will be the excess or deficit of revenues versus day-to-day operating costs?
- How much of the capital cost can reasonably be expected to come from grants?
- Of the balance, how much do the present owners expect to contribute? (Note: if the value of "sweat equity" has been included in the capital-cost estimate then that value can be combined with the cash that an owner will bring.)
- Of what remains to be financed, what is a reasonable split between new investors providing equity and loans? The higher the simple feasibility test number the more likely will be the prospect of securing loans. Rarely will banks finance more than 70 per cent of this total regardless of the attractiveness of the project return calculation.
- Estimate the cost of a loan (interest rate). This will probably be a few percentage points higher than is offered to the best companies in a country.
- Test a few different loan methods.
- Determine annual debt service coverage results.
- Repeat, modifying the percentage of debt and method until a reasonable coverage can be shown. "Reasonable" begins somewhere around 1.3 times to about 1.6 times (that is, the amount available to pay debt service is between 130 per cent and 160 per cent of the amount which must be paid).
- Repeat with different combinations of grants, investment and equity.

8/ From the previous steps we now know the following:

Capital costs are:	1,115,000	
Amount to be paid with grants:	50,000	
Balance:	1,065,000	
Owner's equity investment (amount from Champion):	100,000	
Balance to be raised:	965,000	
Equity from new owner – investors:	365,000	
<b>Balance to be raised from loans:</b>	<b>600,000</b>	<b>56%</b>

In order to implement this proposal, a 600,000 loan is needed. The next steps are to calculate what terms are affordable, so let us assume:

Loan amount	600,000
Assumed interest rate	8.5%
Number of years of loan	10

9/ [OPTIONAL Lesson within session – this is often a very difficult concept and should be tested] There are three debt service coverage methods that need to be compared:

1. Interest only for three years, followed by equal payments every year
2. Equal payments every year
3. Interest based on the unpaid balance (principal) with equal principal payments every year

	<b>Method 1</b>	<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4 etc.</b>
Enter this amount in years 1, 2 and 3	51,000		51,000	51,000	51,000	



Enter this amount in year 4 to the end

117,222

				117,222
Debt service*	<b>51,000</b>	<b>51,000</b>	<b>51,000</b>	<b>117,222</b>
Loan balance	600,000	600,000	600,000	533,778
Interest	-51,000	-51,000	-51,000	-51,000

**Method 2**

Enter this amount in year 1 to the end

91,445

<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4 etc.</b>
Debt service*	91,445	91,445	91,445	91,445
Interest	-51,000	-47,562	-43,832	-39,785
Loan balance	559,555	515,673	468,061	416,401

Enter this amount in year 1 to the end  
**Method 3**  
 60,000

<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4 etc.</b>
Principal	60,000	60,000	60,000	60,000
Interest	51,000	45,900	40,800	35,700
Debt service*	111,000	105,900	100,800	95,700
Loan balance	540,000	480,000	420,000	360,000

\* Debt service coverage is the combination of principal and interest to be paid on a loan.

One very important measure of whether a loan makes sense is to compare the amount of monies expected in that year from all sources (after paying all the bills) to the debt service payment to be made.

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Net revenue available for debt service</b>	<b>30,500</b>	<b>118,000</b>	<b>137,000</b>	<b>179,000</b>
Debt service method 1	51,000	51,000	51,000	117,222
Debt service method 2	91,445	91,445	91,445	91,445
Debt service method 3	111,000	105,900	100,800	95,700

If a debt service payment (p+i) totals 51,000 and the monies available total 118,000 in the same currency, the debt service coverage ratio is 2.3. Such would be the case for a loan for which only interest is paid in the early years. However, if the loan repayment is principal and interest such that an equal amount is paid every year, then the debt service could total 91,000. The resulting debt service coverage ratio (DSCR) is then 1.3 (118,000/91,445). When seeking a loan, annual debt service coverage calculations are important.

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
Debt service coverage ratio method 1	0.6	2.3	2.7	1.5
DSCR method 2	0.3	1.3	1.5	2.0
DCSR method 3	0.3	1.1	1.4	1.9

In this example, method 2 arrives at and remains at a reliable, conservative coverage ratio.

10/ Keep in mind:

- That lenders tend to worry about DSCRs that are 1.4 or below.
- That lenders may restrict the amount of cash that can be distributed to investors/owners.
- That lenders can insist that certain debt service coverage “tests” must be met.
- That lenders can insist on reserves being set aside for future debt service before payments to investors/owners (called “dividends”) can be made.

11/ A base case is the best available thinking on the combination of grants, loans and investment to finance a proposal and the cash flows that result from operations. Once a financing plan is in place, it is a straightforward process to calculate depreciation and taxes, combine that result with principal and interest information and build a complete picture: cash flow incoming and outgoing items, debt service structure and results, income statement and investor return. A balance sheet can also be built up, but it is really an extra at this point.

Base case – financial, social and environmental

			Year -2	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	
<b>Capital costs</b>										
From donors	Capital grants	50,000			50,000					
From owner-investors	Equity investment	465,000	174,648	159,366	130,986	44%	of total value			
From lenders	Loans	600,000	225,352	205,634	169,014	56%	of total value			
	<b>Capital costs</b>	<b>1,115,000</b>	<b>400,000</b>	<b>365,000</b>	<b>350,000</b>					
<b>Operations</b>			<b>Year -2</b>	<b>Year -1</b>	<b>Year 0</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	
Revenues	4,290,000					140,000	241,000	261,000	304,000	
Operating grants or subsidies	12,500					12,500	0	0	0	
Operating costs	1,880,000					122,000	123,000	124,000	125,000	
Net revenues from operations (EBITDA)	1,532,500	(For length of loan only)				30,500	118,000	137,000	179,000	
Interest	314,446					51,000	47,562	43,832	39,785	
Taxes						0	0	792	12,304	
Depreciation						90,000	90,000	90,000	90,000	
Net income						(110,500)	(19,562)	2,376	36,911	
Add back:										
Depreciation						90,000	90,000	90,000	90,000	
Less:										
amortization/principal payments	600,000					40,445	43,882	47,612	51,659	
Net cash flow to owner-investors		IRR	8.4%	(174,648)	(159,366)	(130,366)	(60,945)	26,555	44,763	75,252
DSCR	1.68						0.33	1.29	1.50	1.96

12/ Most of the above information is simply a build-up of previous work. What is new here are a few simple statements: the return to investors and the debt service coverage results. These metrics, combined with the social and environmental impacts of the proposal, are what is being offered to donors, lenders and investors.

Impact	Year -2	Year -1	Year 0	Year 1	Year 2 etc.
Construction jobs (no.)					
Operating jobs (no.)					
Improved income (amt.)					
Clean water (litres)					
Land improvements (hectares)					
Education and information inputs (hours)					
Reduced unsustainable fuel (kg)					
Avoided greenhouse gas (CO <sub>2</sub> )					

Once mastered, this building-block process can be applied to many proposals and situations and will allow conversations between Champions and Enablers (and even with

financial experts). THIS IS THE CONFIDENCE BUILDER TO BE EMPHASIZED AND DISCUSSED.

**Session Feedback Notes**

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Nine – What if? Conducting Sensitivity Analysis

### Session 9

#### What if? sensitivity analysis

- Information Content – use of checklists of things that might go wrong
- Technique Content – risk analysis, sensitivity analysis ... grouping like events and impacts
- Exercise – a series of sensitivity cases will be prepared and an inventory made of key versus “other” risks

Organizing Principle: “Nothing goes as planned!”

Session Objectives-to test the base case and thereby determine its vulnerability to changes in assumptions

Information Content – that problems can be grouped

Technique Content- sensitivity analysis and summarizing impacts

Structure-Lecture and Exercise (classifying different events into groups of events), followed by a What if? Discussion

Exercises-classify various events into What if? Impact Groups; working with authors prepare a contingency list and begin the discussion of Risk Analysis

#### Trainer Notes

1/ This session deals with lessons that most Champions see (initially) as unnecessary. This comes from their belief that the proposal will roll out as planned. Convincing Champions to undertake and present contingency planning can be an easy or a very difficult chore. Intractable responses by Champions are a good indicator of inflexibility and a cause for worry.

2/ Preparing sensitivity analyses (answering the question “What If?”): How reasonable is it to expect these results?

- ☑ Itemize the list of things that might not go as planned (timing, cost, revenue, output variations).
- ☑ Itemize the list of things outside the plan that might affect its implementation (loss of a key person, macroeconomic factors, instability).

*Questions:* What if the primary source of raw materials, products or construction is not available? What if costs are higher or lower? What if units sold or delivered are fewer or more? What if key members of the team are not available?

3/ This process is not as complex as it might seem. It is built on an understanding of the interrelationships between the pieces of a proposal. Many things can cause costs to be 5 per cent higher. It is not necessary to calculate each one. It suffices to say that a 5 per cent cost increase can be caused by any or all of the following factors X, Y or Z and that such an increase will have the following effect on the proposal's results measured by the financial, social and environmental metrics (in the case of the financial metric, IRR). This statement – that grouping similar types of events into categories reduces the complexity of sensitivity analysis is a good “selling” feature to advertise and is the basis of the EXERCISE in this session.

4/ Impacts on base case -- Examine seven “What If” questions (scenarios):

Base case			What If	IRR	Average DSCR
Capital cost	1,115,000	A	5% higher, all equity	7.3%	no change
Year 1 revenue	140,000	B	20% lower	7.9%	1.65
Year 2 revenue	241,000	C	20% lower	7.7%	1.62
Revenue all	4,290,000	D	10% lower	3.6%	1.37
Revenue all	4,290,000	E	10% higher	12.6%	1.98
Operating costs, all	1,880,000	F	15% higher	5.3%	1.47
Cost of debt	8.5%	G	9.5%	8.0%	1.60
IRR to investors	8.4%				
Average DSCR	1.68				

Social and environmental impact sensitivity of various “cases”

- Case A – no change unless programme is curtailed to avoid higher cost
- Case B – less local employment and income generation pro rata
- Case C – same as B
- Cases D and E – 10 per cent changes will have minimal impact on social and environmental improvements
- Case F – no impact

5/ DISCUSS - Which of the preceding cases pose serious threats to the viability of the proposal?

There are other factors that need to be considered, some within the control and estimation of the Champion and some not. A currency revaluation can be translated quite easily into increased costs or revenues. But what about civil disorder?

Global oil prices can be translated into higher transport costs and, perhaps, into greater revenues depending on the pricing arrangement, but what about the death or illness of the Champion? The point is this: when looking at a reasonable list of “What If” questions, some can be translated into impacts and actions and some cannot. A life insurance policy can repay a lender if a Champion dies suddenly, but a succession plan is needed if the proposal is to continue. This is a paper-and-pencil and thinking exercise, not a calculation. Some of the results can be included in the “risks” section of a proposal;

others represent good planning and may come up in donor, lender and investor discussions.

6/ Risks --Risks come in a variety of categories and understanding the vocabulary can speed discussions between Champions and Enablers.

- ☑ Completion risk involves the risk that something started might not be completed after a lender has made funds available. This can happen when a proposal costs far more than originally expected or the market has changed significantly during construction. Completion risk can be managed through the type of contract entered into to design, build and commission (start operation).
- ☑ Technology risk involves something not performing as planned or becoming obsolete far more rapidly than expected. If the technology never performs as agreed to in the installation phase this can be part of completion risk, but generally it is considered to be in a separate category. Technology risk is most often managed through guarantees and warranties from the suppliers of equipment and also through the acceptance testing process. Longer-term performance can be enhanced through operations and maintenance contracts and various types of insurance.
- ☑ Supply risk involves raw materials not being available. This can include resources which the project is going to use (e.g., a mine or a plantation forest) or buy (e.g., fuel or supplies). Managing supply risk sometimes requires entering contracts for sufficiently long enough periods of time and with predictable prices to assure an uninterrupted supply of inputs.
- ☑ Economic risk exists even after a project is completed, the technology is working and the inputs are available. The result might be inefficient or the estimated market (“demand”) evaporates. Confidence in (conservative and realistic) market projections and the Champion’s demonstration of market knowledge and awareness are crucial in managing economic risk.
- ☑ Financial risk occurs either when variable interest rates are used, refinancing of the project is assumed sometime during its life or additional financing is required in the future. Interest rates change. Large changes can make an enterprise non-competitive or not “liquid” (“liquidity” means having the cash to meet repayment obligation to lenders).
- ☑ Currency risk is closely related to financial risk and could be lumped into that category, but the very nature of technology transfer projects warrants it being treated separately. Currency risk involves the difference between the value of the currency that impacts income or expenses and the value of the currency in which the loan repayments must be made.
- ☑ Political risk involves the risk that the rules and regulations governing a proposal might change. A good example might be the risk that a government may arbitrarily raise the taxes on a project to render it not economic.
- ☑ Environmental risk involves unknown environmental conditions that might disrupt a plan after it is begun.

- ☑ Social risk is a category that takes into account all manner of social disturbances or disruptions that can impair a proposal’s implementation.
- ☑ Force majeure risk is the risk that something catastrophic – a storm, an earthquake, a devastating accident – may cause a project to fail. Insurance programmes directly address force majeure risks.

## WHAT IF Template

### Contingency Planning

“What If” things do not go as planned? Professionals know that very few things roll out exactly as planned. A proponent should identify the key events that can alter cost, timing, service delivery and outcome. The Champion can demonstrate how he/she plans for contingencies.

Variable	What If	IRR	Average DSCR	Social Impact	
<b>Capital Cost</b>	5% higher, all equity				
	10% higher, all equity				
<b>Operating Costs Year1</b>	15% higher				
	20% higher				
<b>Operating Costs Year2</b>	20% higher				
	25% higher				
<b>Revenue Year1</b>	20% lower				
	25% lower				
<b>Revenue Year2</b>	10% lower				
	15% lower				
<b>Transportation Costs</b>	10% higher				
	15% higher				
<b>Raw Materials Costs</b>	10% higher				
	15% higher				
<b>Construction Costs</b>	15% higher				
	25% higher				



<b>Exchange Rate</b>	goes 5% against you				
	goes 7% against you				
<b>Taxes</b>	Increase by 5%				
	Increase by 7%				
<b>Regulation</b>	Unfavourably Changes				
<b>Primary Source of Raw Materials</b>	Dries up				
	Alternative costly by 20%				
<b>Construction Schedule</b>	Delayed by 3 months				
	Delayed by 6 months				
	Delayed by 9 months				
<b>Key Personnel</b>	Leave the job				
<b>Flooding</b>	Hits the area				
<b>Rain Fall</b>	Decreases sharply				
<b>Customer Response</b>	Does not improve in 3 months				
	Does not improve in 6 months				
<b>Competition</b>	Resorts to price wars				

Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**

- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Ten – To Whom? Targeting and Presenting the Request

### Session 10 To Whom?

- Information Content: types of enablers and funders, relationship of funders to rates of return
- Technique Content: classifying and matching funding needs to enablers
- Exercise: teams (with authors) create a list of what to pursue
- Peter Storey introduces PFAN

Organizing Principle – “Avoid presenting your perfect proposal to the wrong person.”

Session Objectives-to determine the most likely courses of action to obtain the required resources

Information Content- the matrix relating the results of proposals with the roster of possible Enablers interested in those results

Technique Content- avoiding false trails

Structure- Lecture and Discussion

Exercise-the discussion here is an exercise with two points: first to illustrate the mis-direction of proposals and, second, to stimulate the concept of a network of advisors and collaborators

Reference Materials- Targeting Matrix

#### Trainer Notes

1/ Targeting the result (answering the question “To Whom?”) -- knowing the audience and the request – requires three things:

- ☑ Itemizing what to ask for; that is, itemizing what is needed.
- ☑ Researching the categories of financial support and other resources.
- ☑ Narrowing the search: make inquiries. Identify contacts. Network!

2/ Itemizing what to ask for means knowing what to ask for in three different dimensions:

- Type of funding or support (grant, loan, investment, assistance).
- Stage of funding (planning, construction, operations).
- Amount and timing of funding (in advance, pro-rata to others, last in).

In the illustrative proposal set forth here, the Champion is seeking grants from donors totalling 62,500, investment capital from new owners of 465,000 and a loan of 600,000 (for 10 years at 8.5 per cent annual interest).

3/ Researching the categories means spending time (quite a bit of time) on the internet, phone and e-mail finding out what programmes and organizations exist, what they offer and what they are looking for. Too often the search begins with what is available rather than what is needed, causing disconnected conversations between Champions and Enablers.

Clearly this is a “middle of the pack” proposal, neither very profitable nor decidedly unsustainable. Social investors and donors will emerge as “best bets”.

4/ Narrowing the search means being careful and patient; sending a 20-page proposal to someone “cold” rarely works. With e-mail and a few low-key inquiring phone calls, it is pretty easy to figure out how to approach a donor, lender or investor. A simple inquiry that introduces the proposal being formulated (three to five sentences) and expresses the need requiring attention will normally get a simple and clear response. Seeking grants, loans and investors is neither simpler nor more complex than the tried and true process of inquiry leading to interest leading to information exchange. All the more reason for the Champion to have a well-developed proposal, with a plan of action and a request for resources.

5/ DISCUSSION OF THE NEED FOR NETWORKS - One of the frequently heard laments is that there is no shortage of money but there is a shortage of quality proposals. There are two elements to this lament. The first is that there is a “disconnect” between Champions and Enablers. Up to this point, this guidebook has been devoted to repairing that “disconnect” by creating a framework and common understanding as to the requirements of a well-prepared proposal. The second element of this lament reflects another “disconnect”: well prepared proposals need to be presented by Champions to the right group of enabling organizations. A brilliant proposal for financing the construction of a proven wind-biodiesel hybrid energy system on a remote island is of little value if presented to a technology development/technical assistance programme of a European government.

There are thousands of sources of funding and services. Even focused on just clean technology, the list easily reaches hundreds if not thousands. This chapter places this vast collection into a few simple categories which will allow a more focused search by Champions for compatible Enablers. It then describes a process for undertaking that search and reaching out to those individuals, organizations and programmes. Sadly, there is no right way to do so – just some guidance to share – and there is no substitute for the difficult chore of knocking on doors.

This chapter is short because, if a proposal has been assembled in a clear manner, this next step is *very, very focused*. At this point, the job of the Champion is to get his or her proposal, in the right form, in front of the right person in the right organization that has the appropriate resources and interests.

6/ Review (reinforcement) of funding types [OPTIONAL]  
Types of funding and services

Loans are based on the ability of the proposal to repay amounts, generally under fixed terms and conditions. It must be demonstrated that a very conservative output of the proposal can more than repay the loan. This requires matching the schedule of revenue generation with the scheduled loan repayment and exceeding that schedule by a factor of say 50 per cent (which is called a 1.5 times debt service coverage, meaning that for every dollar, euro, rupee, peso or CFA of loan to be repaid, 1.5 units are expected to be available at the time the payment is due). A lender wants to know that all the other funding needed to build and operate the facility is in place, that there are guarantees that costs will be managed and that if there are additional costs others are prepared to pay them and capable of doing so.

Grants and donors: If the request is for grant funding to provide important goods or services, because revenues cannot cover costs and the proposal has a negative rate of financial return, the donor will need to understand why the plan is an efficient use of scarce resources, where the plan fits in with other programmes and priorities, how the proposal meets the donor's stated core objectives and, very importantly, what will happen when the donor funding is used up. Key words to understand and deal with include efficiency, effectiveness, sustainability and context. A customized "logical framework" may help to communicate the Champion's mastery of the needs and responses proposed.

Development, specialized and "triple-bottom-line" investor-lenders: Lending and investment oriented to development, environmental and financial objectives. Usually involves the creation of human and physical infrastructure with modest financial return expectations and higher risk, but the payoff is a sustainable operation and good developmental and environmental impacts. Funding to create such infrastructure and begin such an operation may or may not be recovered over a commercially reasonable period of time. If start-up capital is being sought, then the ability to repay it over time and upon success needs to be demonstrated. Whether or not the capital will actually be repaid is a separate issue. Initially it needs to be shown that the revenues from repayments, after allowing for defaults and allowing for administrative costs, are sufficient to cover the cost of capital to achieve operational self-sufficiency, meaning that the proposal is on a path towards institutional self-sufficiency, which implies the ability to borrow capital regularly through a variety of commercially available sources, manage operations and repay those borrowings while increasing equity (the original start-up capital plus profits).

Venture capitalists and specialized investors: If the request is to obtain risk capital for something new, it needs to be shown that there is either a very handsome return to be made on the initiative or a larger market with high returns to tap once the proposal has proved its case. Venture capitalists understand the assumption of risk, so after the return and market potential are demonstrated it needs to be shown that the assembled team can manage the expected bumps in the road. If the technology is new or new to the setting, how will breakdowns and setbacks be managed? If the profitability of the initiative is ultimately determined by the monetization of carbon benefits, how will this occur and why is this place the best place and why is this the best team to make it happen, especially if it has not happened before? If the market is going to grow, how will the venture grow and handle competition? Is there a first-mover advantage? How will these investors convert success into cash (exit strategy).

7/ Review (reinforcement) of financial return concept [OPTIONAL]

Project or proposal rate of return is derived by posting the capital costs and the operating revenues and costs in their appropriate years. Net present value and internal rate of return techniques give a time value to money. Anything beyond 15 years tends to have very little impact on these two results. (Year 1 is the first year of operations, all other prior years being zero, minus one, minus two, etc).

For each year, total the amounts outgoing and incoming. Total capital costs are a minus because these are outflows; grants are a plus because they are inflows; operating cash flow is a combination of ins and outs.

For each year, total the cash flow (out equals minus; in equals positive).

Calculate the internal rate of return.

If negative, revenues and grants cannot cover the capital and operating costs of the proposal. Without *additional grants or subsidy*, the proposal is probably not financially viable.

If positive, but below 5–7 per cent, the proposal is financially self-sustaining but may be of limited interest to the private sector. Specialized lenders-investors-donors who value development, environmental and market transformation impacts may consider such a proposal.

If positive and over 5–7 per cent, the proposal’s financial details (especially tax implications, debt structure and any additional revenues) need to be developed further and different financing schemes considered; the result may or may not be of interest to the private sector. Specialized lender-investor-donors who see the blended value potential of investments are likely targets.

If over 10 per cent, the financial details need to be developed with a strong bias towards engaging private-sector investors and lenders.

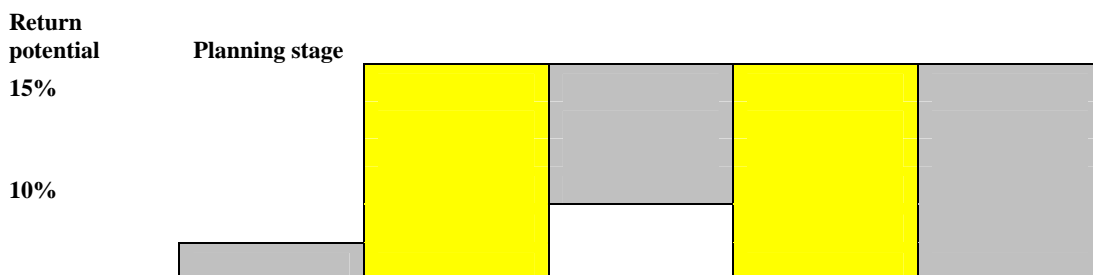
Estimated rate of return	Type of funding
Negative or zero	Grants and subsidies
Zero to between 5 and 7 per cent	Donors and investors who consider social and environmental returns as well as financial ones
Over 5–7 per cent	Specialized lender-investor-donors who see the blended value potential of investments are likely targets
Above 10 per cent	Private-sector investors and lenders

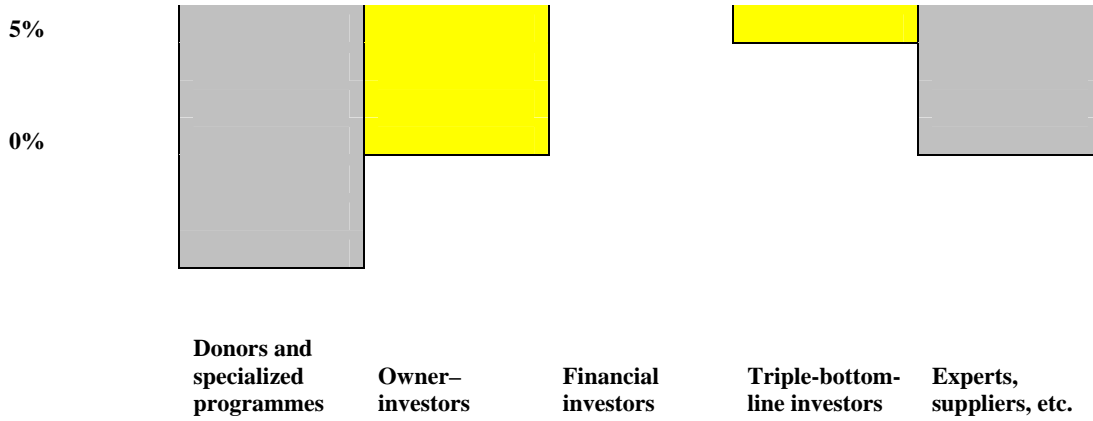
8/ The following section attempt to summarize how a Champion must link what is needed with whom to ask.

Project return – stage-of-funding matrix

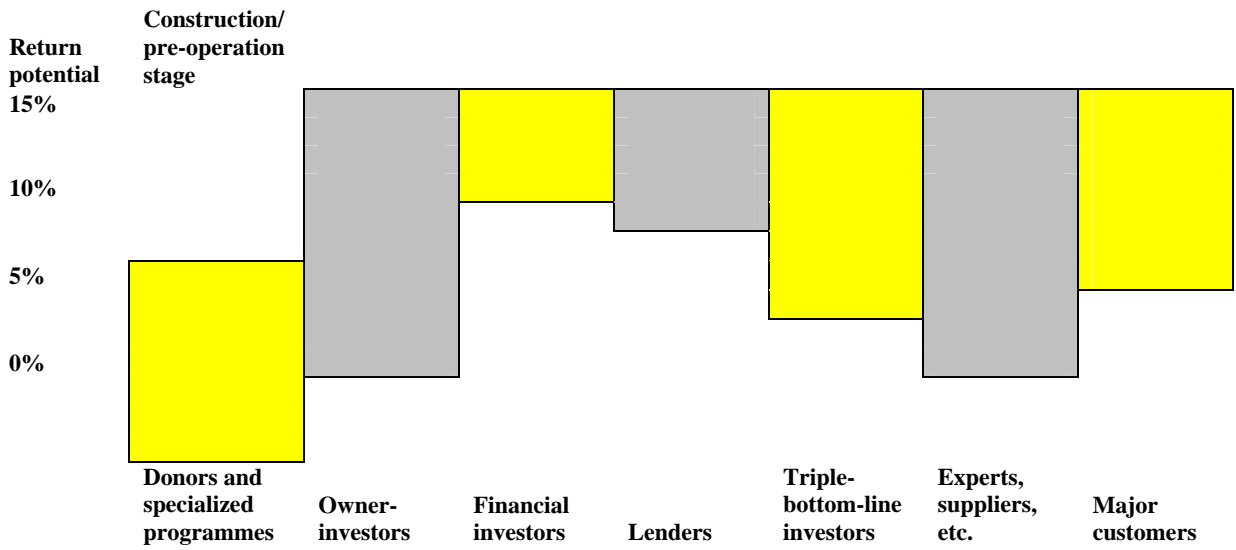
Depending on the return potential, a sample of funders’ interests is represented by the following three charts.

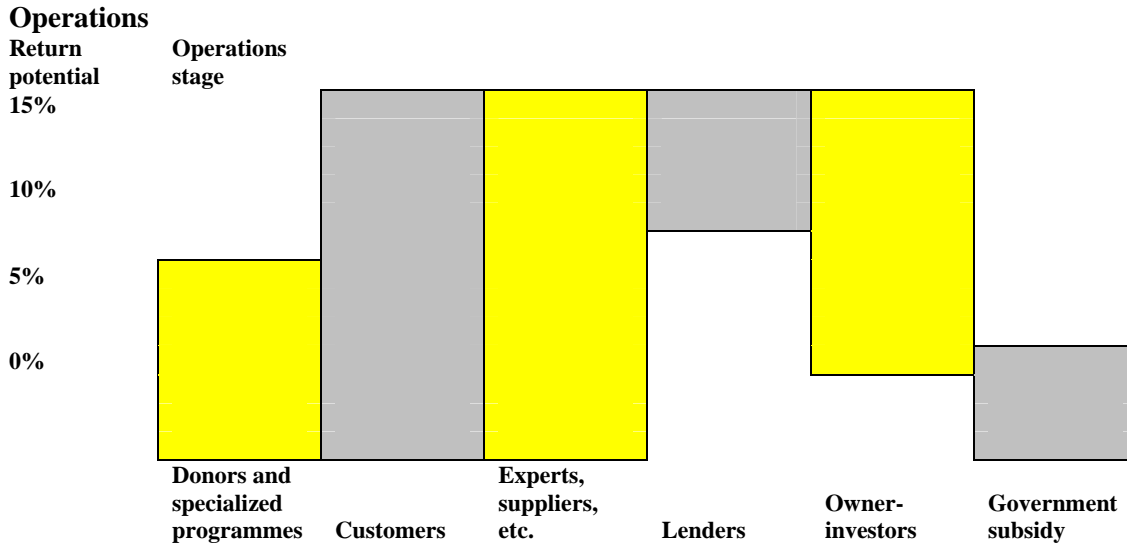
Planning





**Construction**





### 9/ Undertaking the search

- What is being sought?
- Who has it?
- What is known? Unknown?

“A proposal consists of a plan to do something, combined with a request for resources... combined with knowing the audience...” That quote comes from the UNFCCC’s guidebook’s introduction. If all has gone well, by now a Champion will have formulated a plan and refined that plan into a specific request for a loan, a grant, an investment, a partner or a combination of those and other things. Along the way, the Champion should have studied more than 10 and less than 100 websites and printed resources, many of which point in the direction to needed resources. What remains to be done is for the Champion:

- To put more effort into identifying groups and types of enabling organizations that can provide resources. This is called “researching the categories”. For their part, enabling organizations could post clear and current information on the types of proposals being sought.
- To narrow the search to a shortlist of enabling organizations that are compatible with the needs of the proposal.<sup>9</sup>
- To make contact and follow up with as many enabling organizations as possible while staying motivated, and to seek leads from others (network!) until a few possibilities emerge. The Champion should avoid putting all his or her eggs in one basket (should keep the search going) until a mutual commitment between the Champion and the enabling organization is clear and in writing.

<sup>9</sup> One of the most depressing experiences for a Champion is to identify an enabling organization that appears to match well with a proposal only to find out after much effort that the programme promoted on the website is unfunded, fully subscribed or not looking for proposals until two years from now. Enabling organizations have a profound responsibility to be clear, current and transparent in the information posted on websites and in brochures.



10/ “Researching the categories” means spending time on the internet, phone and e-mail finding out what programmes and organizations exist, what they offer and what they are looking for. Too often the search begins with what is available rather than what is needed, causing many disconnects in conversations between Champions and Enablers. At this point in the development of a proposal, the Champion knows what is needed. That narrows the search greatly. Begin with a shortlist of organizations and websites and collect information. A sample of websites is listed in annex IV.

11/ “Narrow the search” means being careful and patient. Sending a 20-page proposal to someone “cold” rarely works. With e-mail and a few low-key inquiring phone calls, it is quite easy to figure out how to approach a donor, lender or investor. A simple inquiry that introduces the proposal being formulated and expresses the need requiring attention has the best chance of getting a simple and clear response (very often disappointing, by the way), such as “Thank you for your inquiry. We no longer support or invest in new technologies, concentrating only on commercially proven technologies in Central America. Best of luck with your proposed project”. As this response demonstrates, it was very important that the original inquiry was clear in the first place. Short, clear inquiries will get responses because what is being asked is easy to answer. A long letter about a “Once in a Century Opportunity to Eliminate Poverty” will most likely go unanswered. Why? Because it was not an inquiry, it was a sales pitch. The publishing profession is a good model: writers make inquiries, editors express interest or not and a process of communications begins. Seeking grants, loans and investors is neither simpler nor more complex than the tried and true process of inquiry leading to interest leading to information exchange. All the more reason for the Champion to have a well developed proposal: a plan of action and a request for resources.

#### 12/ Making contact

“Making contact” means getting some expression of interest (usually in learning more) between Champion and Enabler, which usually entails the submission of the now fully prepared proposal. This is a period of time when it is hugely important for a Champion to listen very carefully and understand the process of the man or woman on the other side of the communication. How should the proposal be presented? Is there an application procedure and schedule? Is this competitive and how is the competition managed? Are there costs involved in making proposals for loans or investment? What is the decision-making body and how are decisions made? The Champion and the Enabler can then – only then, after all the hard work of preparation – really begin the back-and-forth of getting to “yes”.

“Mutual commitment” means that Champions and Enablers agree on the basic shape of their relationship (grant, loan, investment, etc.). They agree on the terms that will govern that relationship and – most important – the steps and requirements for arriving at financial closure. While both Champion and Enabler want to be enthusiastic at this point, it is extremely important for each to be clear with the other about three points: what is being offered and accepted in principle; what terms and conditions apply to that offer; and what steps need to be fulfilled by the two parties. Only when these points are clear –

in a letter, in a term sheet<sup>10</sup> – has the process of preparing and presenting a proposal been completed.

### 13/ Follow-up: The etiquette of seeking funds

For Champions their proposal is the centre of the universe. Even so, it is important to recognize what succeeds and what does not. Lenders and financial investors want facts and documentation of those facts. Donors want facts and context, with a particular interest in efficiency and sustainability. Not all proposals that reach the point of back-and-forth succeed, but screened proposals certainly reach “yes” more often than “cold calls”. Also, pressing too hard rarely works. While the whole process of preparing and presenting a proposal is about money, it is not only about money. Loans, grants and investments tend to be made based on the people and the plan. The resources requested are a means to enable the people to implement the plan.

The most important step in getting to “yes” is when Champions and Enablers succeed in seeing proposals from each other’s perspectives. This is not about filling out a form and passing some examination. It is about building trust and confidence.

How intensely should the Champion follow up? This is a difficult and sensitive issue.

After submitting a proposal it is appropriate, after a few days, to confirm that the proposal has been received and inquire as to the timing of next steps. Rarely is it useful to press for reaction or decision at this point. A Champion should determine the enabling organization’s procedures and approach and ask about the timing of additional follow-up. He or she should then respect the guidance given (and Enablers should respect the request). If a Champion receives no response to an initial follow-up (e.g., a message left on a voice-mail system), it is appropriate and acceptable to send an e-mail asking for confirmation of receipt and for guidance. If nothing is heard, the next e-mail should indicate that you plan to call at a convenient time for a two-minute conversation on next steps. If still nothing is heard, the silence speaks volumes. If you were invited to submit a proposal in the first place, some carefully managed frustration is appropriate. If yours is a “cold” submission, frustration is neither appropriate nor effective. Move on!

## TO WHOM Template

### Funders

*Directing your Proposal to the Appropriate Audience*

#### Estimated Pre-Tax Rate of Return

#VALUE!
---------

*See funding  
matrix*

Estimated Rate of Return	Type of funding
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<sup>10</sup> See annex VII for a sample term sheet that has enough information to warrant a *small* celebration and moving on to the next phase of the relationship between Champion and Enabler.

Negative or zero	Grants and subsidies
Zero to between five and seven percent	Donors and investors who consider social and environmental returns as well as financial ones
Over five to seven percent	Specialized lender-investor-donors who see the blended value potential of investments will likely be a target
Above ten percent	Private sector investors and lenders

### Types of Donors (D), Lenders (L) and Investors (I)

Type of Enabler		Type of Money Provided	Expectations/Needs
D	Donors and Specialized Programs	Grants	The donor will expect that the grant will either be used as an addition to revenue to run the business (operating grant) or to reduce the cost of the proposal so that loans and equity will cover the balance (capital grant). Donors need to understand why the plan is an efficient use of scarce resources, where the plan fits in with other programs and priorities, how the proposal meets the donor's stated core objectives and, very importantly, what will happen when the donor funding is used up.
D	Government-sponsored programs	Grants	
D	Charitable Organizations	Grants	
D	Multilateral development organizations	Grants	
L	Government sponsored subsidy program	Revenue	They expect that revenues will cover the cost of the product or services and contribute to the operation of the business (including repayment of loans). The expectation is that left over revenues are first applied to the providers of equity, then to other operating expenses (these would include taxes, for example, and any interest on loans); and finally, to loan payments (such payments are called principal or amortization, while the combination of principal and interest on loans is called "debt service").
L	Government-sponsored development institution	Loans	Lenders expect a very specific set of payments over time. Requirements are usually well defined in terms of conditions that must be met in advance and over the course of the loan. Lenders do not want to take risks. Lenders want to be repaid and, if the business cannot make that repayment, they want to know that others will make the payment or that assets of equivalent value are available to reimburse them. Loans are made to fund the construction of a project or the purchase of goods or the provision of services where the revenues from the goods or services are expected to be more than sufficient to repay the loans as and when promised. Some lenders are flexible in their loans for a
L	Commercial Banks	Loans	

L, I	Socially responsible and specialized investment funds	Loans, equity	variety of reasons. Others are absolutely not. The project needs to demonstrate that a very conservative estimation of revenue can more than repay the loan. Lenders need clear procedures in place in case of loan default, termination or repossession.
I	Development Investors	Equity	Investors expect a higher return than lenders and are willing to take more risk, but this should not be confused with being risk-takers. They are equally clear about what they are willing to do or not do. Their interests are in seeing a business succeed and in earning a return on their investment. If they become significant participants in a business, they tend to establish very specific (and stringent) targets to make sure that things are going well. When things are not going well, investors often have the ability to make significant changes in a business, including replacement of the management team. Investors only get repaid if a proposal is successful and profitable. Positive rates of return and market potential needs to be demonstrated, as well as that the assembled team can manage the expected "bumps in the road". They are also interested in the market size, the reasonableness of the base case, potential upside and downside and exit strategies.
I	Strategic Investors	Equity	
I	Triple Bottom Line Investors	Equity	
I	Venture Capitalists	Equity	
I	Owners of businesses	Equity	
I	Sponsors of social programs	Equity	
I	Financial Investors	Equity	

Type of Funding	Defintion	Other funding models that fall under this type
Grants	Grants do not need to be repaid.	Capital and operating grants
Revenue	Revnuue for products and services, including operating subsidies.	Sale of carbon credits or pollution benefits
Loans	Loans are made based on the ability of the proposal to repay what is borrowed under clearly defined terms.	Leasing, BOT's (build, operate and transfer), installment sales or purchases (hire-purchase), financing or credit terms from a supplier
Equity	Equity investments are made in return for a share of the profits upon the success of what is proposed.	Mezzanine debt, preferred shares, quasi-debt and quasi-equity (combinations of loans and equity).

### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**

- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Eleven – Customization and Summarizing

### Session 11

#### Customizing and Summarizing

- Information Content: types of customization, key elements of summarization
- Technique Content: carbon monetization
- Exercise: a carbon monetization calculation and adjustment to an IRR ... teams summarize “their” proposals on one page and prepare 5 minute presentations

Session Objectives-to introduce the requirements of specialized Enablers

Information Content – four different and most common customized presentations but a focus on carbon monetization

Technique Content- preparing each, understanding the requirements to be met

Structure – Lecture and, time permitting, Discussion

Exercise: calculating carbon benefit or debt service coverage ration as confidence builder

#### Trainer Notes

1/ Thus far, the common ingredients of a proposal have been described. Often, however, four additional elements may or may not be needed before a proposal can be presented. This chapter describes four such “customizations”.

Proposals to grant-makers and donors may require a logical framework

Proposals to climate change professionals may require elaboration of carbon benefits

Proposals to lenders need to address risk and risk management

Proposals to equity investors need to address their special interests

#### 2/ Logical framework customization

Especially for grant proposals to donors, it is very important to place the proposal in its broader context. This allows donors and other enablers to see how the proposal fits within their planned activities and also to see the connection between the broad goals being pursued (e.g., “improve global climate”) and very specific activities (such as “training entrepreneurs to design, build and sell household biogas digesters in rural Bangladesh”). A logical framework analysis and matrix is one way to provide this context. Excellent web-based resources on preparing such presentations are available, but the basic process and presentation can be summarized as follows.

- ☑ Goal: Within a proposal that employs a logical-framework approach, the goal is the broad (global, national or sector) benefit being pursued (such as improving the global climate). It is what the proposal will contribute towards achieving but will

not in itself achieve or be solely accountable for. The goal must be described and indicators established to measure progress in reaching the goal (e.g., carbon dioxide emissions per capita). The indicators need to be verifiable and the proposal must set forth how such verification is going to occur (for example, using biannual estimates of household consumption of non-renewable fuelwood, other biomass and liquid fuels). Finally, the assumptions made concerning this goal-setting must be explained (along lines such as a statement that the biogas programme is being implemented with 30 per cent of the funding coming from climate-related activities or that climate-related monitoring and evaluation will suffice to establish the means of verification).

- ☑ Purpose: The purpose is what the proposal will achieve. After identifying the goal of the proposal, the various development outcomes being pursued need to be identified, and – as for the goals – the indicators, means of verification and assumptions must be described. For example, the purposes of the proposal might include reducing non-sustainable fuelwood consumption, reducing fossil fuel consumption, improving local soil and sanitary conditions and increasing income from sustainable activities.
- ☑ Objectives are the significant components which the proposal will achieve. Objectives for each of the purposes must be explained; for example, a 60 per cent reduction in fuelwood consumption, a 90 per cent reduction in kerosene use, replacement of chemical fertilizer with dried organic slurry and an average productive workday/study time increase of an hour per household. As was the case for goals and purposes, the proposal must summarize what indicators will be measured, how those measurements will be updated and verified and – this is important – the assumptions being made by the Champion (which might include, for example, a certain level of funding and flexibility requested in the proposal).
- ☑ Outputs are the specific results and tangible products which the proposal will produce through a series of tasks and activities. Following the establishment of objectives, the logical-framework approach asks that those objectives be set forth over the time frame of the proposal so that progress can be measured. If a 90 per cent reduction in kerosene usage is expected in each household, will that be immediate? Because the proposal might roll out over many communities over time, is there an aggregate measure for total households that can be monitored? Again, the proposal's assumptions about available resources need to be made abundantly clear. What this technique does is help the Champion understand all the pieces that need to come together to realize success. It can prove a very useful step in answering the “How” question within the seven-question framework.
- ☑ Activities are the specific tasks which the proposal will undertake to achieve the required outputs. As the final stage, and only after the above context-setting exercise has been carried out, the logical-framework approach requires setting forth the specific activities of the proposal, such as capacity-building of households and entrepreneurs, financing and construction of household biogas units, microfinance collection and performance monitoring, and management reporting and evaluations. By using such a framework, it becomes abundantly clear what activities fit within the goal and purposes set forth and which are questionable.

Why use a logical framework approach? Quite simply, it allows the Champion to demonstrate a mastery of the situation. Further, it facilitates screening and discarding competing ideas for activities in a logical manner. In addition, it sharpens the Champion's thinking and his or her ability to present a successful proposal. The most important benefit, however, of this approach is that it allows the Champion to screen potential support organizations, whether these are donors, lenders, investors or assistance providers. *Their* goals and purposes, *their* areas of activity support become easy to compare with those of the proposal. The Clean Development Mechanism (CDM) supports climate change mitigation activities – so there is a potential match. Say that the Lemelson Foundation supports innovation and entrepreneurship: there might be a match there, or so we may think until their purposes are explored and it is realized that the core of *their* goals and purposes is technical innovations and inventions. We find out that Grameen Shakti supports rural energy and E+Co supports enterprise finance; perhaps productive leads may follow, but we discover that Grameen Shakti is operational rather than a funder of others. Small grants from GEF might make sense also. Thus, the Champion can use the results of the logical framework to rule out, with equal clarity, those uninterested donors, lenders or investors and dozens of others and make the final step in the process – presenting the proposal – easier.

### 3/ Carbon benefit customization –

There are many reasons to incorporate basic carbon benefit information in a proposal. Some are current and clear – applying for CDM approval, facilitating the sale of carbon benefits in either the formal (CER) or informal (VER) markets, seeking grants or loans from GEF, demonstrating a significant triple-bottom-line impact to a social investor – while some are still to be determined, such as the value of a metric tonne of carbon dioxide equivalent after 2012 (also referred to as “post-Kyoto”).

Whether applying to CDM or GEF or seeking other approval or funding resources or pursuing Voluntary Emission Reductions (VERs), there are specific templates and procedures that must be followed when applying. This section points to basic information that should be understood before pursuing such sources and suggests the information that should be incorporated in any proposal including carbon benefits. Such information might interest investors and lenders for whom carbon benefit is not a primary issue.

Carbon benefits occur when a sustainable resource displaces an unsustainable one or a quantity of carbon is kept in place rather than being released, for example, through such adaptation techniques as “no-till” farming. If cow manure or poultry litter can be used to produce fuel that can be substituted for unsustainably cut fuelwood, every kilogram of firewood not burned results in 1.5 kg of carbon dioxide equivalent avoided. Avoiding this unsustainable burning of fuelwood reduces the amount of carbon dioxide released into the atmosphere. The release of this man-made carbon dioxide equivalent is one factor in a complex chain of factors disrupting global temperatures. A process has been established to quantify such benefits (the so-called certified emission reductions (CERs)), which can be sold to others who may have a need to demonstrate improvements in *their* impact on



global climate. For example, an electricity utility in Japan may acquire credits produced by a small hydroelectricity project in Honduras; the benefit may help the utility meet its commitment to reducing carbon dioxide while helping the project in Honduras become financially viable. Carbon benefits are quoted in tonnes of CO<sub>2</sub>e, meaning metric tonnes of carbon dioxide equivalent.

The closest thing that exists to a standard process of quantifying CO<sub>2</sub>e and obtaining CERs or VERs is the Clean Development Mechanism (CDM) and various voluntary standards (Gold Standard, VCS etcetera) . The process (oversimplified for the purposes of the guidebook) has five stages:

- ☑ Design, which involves either the existence or the creation of an approved methodology for measuring the carbon benefit; establishment of a baseline from which the impact of the proposal can be measured; and preparation of a document for submission to the bodies (domestic and international) which must approve it. It is significantly easier to use an approved methodology than try to trailblaze a new one.
- ☑ Validation and registration, which involves an independent review and acceptance of the design and subsequent registration by the main approval body.
- ☑ Monitoring, which involves measuring actual as opposed to design performance.
- ☑ Verification, which is independent confirmation of the monitored results.
- ☑ Actual issuance of the certified emission reductions.

Separate from this process, the Champion, either directly or through intermediaries – the carbon benefit business is growing rapidly – can organize the terms and conditions under which carbon benefits can be sold. There are various markets (one for intra-european activities) and funds and other buyers for whom CERs will have value. In practice, however, the Champion must determine the importance of carbon benefits to the proposal. Landfill gas captured and used for energy production is very valuable because the carbon dioxide equivalent of the captured methane is very high. The carbon benefit value of a well designed and implemented landfill-gas project may exceed the value of the energy produced. A household biogas programme replacing fuelwood may produce a carbon benefit equal to 30–40 per cent of the capital cost, making it affordable to larger numbers of poor households when the carbon benefit is taken into account. A project to substitute sustainably produced alcohol as a cooking fuel instead of kerosene may equalize the cost to the consumer and thus encourage switching from an unsustainable to a sustainable fuel and enhance self-reliance, health and energy security.

[OPTIONAL] Note: The following is an example of the impact of carbon benefits on transactions and how to prepare such an estimate. It is *not* meant to illustrate formal CDM calculations (see the CDM website, <http://cdm.unfccc.int/>, for further information). It *is* intended to illustrate the potential of carbon benefits from a financial and proposal impact perspective. The point: formal CDM approval and methodology is a precise and technically sophisticated process. Even so, it is important for Champions and Enablers alike to have a general “order of magnitude” comfort with the disciplines involved.

**Example of a proposal presentation incorporating CDM**

Household biogas – pro-forma analysis – analysis of impact on customer cost. Based on saving 4 tonnes CO<sub>2</sub>e per year (= 1.5 times the annual tonnes of unsustainably harvested fuel wood

+ 2.5 times the annual consumption of kerosene replaced by biogas cooking and lighting, net of any losses).

<b>Monthly cost calculation</b>	Capital cost 25,000	
CO <sub>2</sub> e per year	4	Tonnes
Contract crediting period	6	Years
Price per tonne	6	Euros
€1 =	81	(↓Local currency↓)
Price per tonne	486	
Discount rate	12%	
Crediting percentage	100%	
Capital cost	25,000	25,000
CO <sub>2</sub> e credit	7,993	Without CO <sub>2</sub> e credit
Net cost to household	17,007	25,000
Down payment percentage	15%	15%
Down payment amount	2,551	3,750
Base finance amount	14,456	21,250
Number of years	3	3
Service charge (one year “flat”)	6%	6%
Finance amount, including service charge	17,058	25,075
<b>Payment/month/base case</b>	<b>474</b>	<b>697</b>
Total payments	17,058	25,075
Finance amount	14,456	21,250
Service charge	2,602	3,825
Down payment	2,551	3,750
Grand total	19,610	28,825

32%  
Carbon benefit

This example also offers an opportunity to reinforce sensitivity analysis skills and explore its usefulness. The following is an analysis of the impacts of various changes to the assumptions used in the base case.

**Base case (highlighted in yellow)**

Sensitivity					
Case A – service charge (one year flat) changes	6%	7%	8%	9%	
Monthly payment	474	486	498	510	
Case B – discount rate changes	0%	4%	8%	12%	16%
Monthly payment	372	413	447	474	497
Case C – Crediting percentage changes	80%	85%	90%	95%	100%
Monthly payment	518	507	496	485	474
Case D – Tonnes per year changes	2.5	3	3.5	4	4.5
Monthly payment	557	530	502	474	446
Case E – Contract crediting period changes	4	6	8	10	
Monthly payment	532	474	427	391	
Euro price per tonne changes	6	7	8	9	10
Monthly payment	474	437	400	363	325

A second example (one that reinforces the net present value technique) follows. This is a proposal showing the impact of carbon benefit on equalizing fuel switching costs. The presentation shows the potential of a combination of carbon benefit and subsidy to opening a market to the very poor.

**Switching from fuelwood to kerosene → intercept and offer alcohol stove**

Fuelwood per year	1,095	kg
Cost per kg	2	Local currency
Cost per year	2,190	
% unsustainable	90%	
	985.5	kg unsustainable

CO <sub>2</sub> e factor	1.5	wood
CO <sub>2</sub> e benefit	1,478.25	kg
CO <sub>2</sub> e benefit	1.47825	tonnes
Value per tonne	360	Local currency
\$	8	
€	6.7	
Local currency	360	
<b>Value per year</b>	<b>532</b>	<b>Local currency</b>
Alcohol use per year	365	kg
Kerosene use per year	219	kg
Cost of alcohol per kg	20	
Cost of kerosene per kg	30	(Cost per year = 219 × 30 = 6,570)
Possible subsidy BOP <sup>11</sup>	15	per kg
Cost of alcohol stove	1,000	
Cost of kerosene stove	1,000	

**Case: Customers poised to switch from fuelwood to kerosene – intercept and offer alcohol stove, factoring in carbon benefit to close cost gap**

			1	2	3	4	5	Years 1–5
<b>Kerosene</b>	Stove		1,000					1,000
	Fuel		6,570	6,570	6,570	6,570	6,570	32,850
<b>NPV @ 10%</b>		<b>25,815</b>	7,570	6,570	6,570	6,570	6,570	33,850

			1	2	3	4	5	Years 1–5
<b>Alcohol</b>	Stove		1,000					1,000
	Fuel		7,300	7,300	7,300	7,300	7,300	36,500
	CDM		532	532	532	532	532	2,661
<b>NPV @ 10%</b>		<b>26,564</b>	7,768	6,768	6,768	6,768	6,768	34,839

**Case: Switch from fuelwood to alcohol stove with fuel subsidy and carbon benefit – aimed at very poor**

			1	2	3	4	5	Years 1–5
Wood	Fuel		2,190	2,190	2,190	2,190	2,190	10,950
<b>Five-yr. NPV @ 10%</b>		<b>8,302</b>						
<b>Alcohol</b>	Stove		1,000					1,000
	Fuel		7,300	7,300	7,300	7,300	7,300	36,500
	Subsidy		5,475	5,475	5,475	5,475	5,475	27,375
	CDM		532	532	532	532	532	2,661
Cost of alcohol stove alternative			2,293	1,293	1,293	1,293	1,293	7,464
<b>Five-yr. NPV @ 10%</b>		<b>2,492</b>	-103	897	897	897	897	3,486*

Savings/(cost

\* Difference between wood and alcohol stove alternative.

**Summary: Customizing for carbon professionals**

- Exhibit an understanding of the multi-step process
- Exhibit a sense of the current market
- Estimate the carbon impact of the proposal conservatively
- Incorporate carbon benefit in cash-flow estimates as a separate revenue line
- Quantify the impact on project IRR of adding or deleting carbon benefits

4/ Customizing for lenders - It is a mistake – a common mistake in proposal writing – to lump lenders and investors together. They are related, but so are brothers and sisters. They have common interests, but their motivations and approach are quite different. Lenders emphasize risk management and look for:

- Predictable cash flow
- Assumption of major uncertainties by others, including insurers

<sup>11</sup> BOP = “bottom of pyramid” = lifeline subsidies.

- ☑ Guarantees that all funding is available
- ☑ Collateral and security interests
- ☑ Clear procedures for default, termination, repossession, etc.

Investors look at these things also but their focus is more on opportunity management, placing emphasis:

- ☑ On the size of the market
- ☑ On the reasonableness of the base case
- ☑ On potential upsides and downsides
- ☑ On management's abilities and knowledge

In customizing a presentation for lenders, the Champions must frankly try to put themselves into the bankers' shoes. This involves understanding two processes: one is called "**due diligence**"; the other is called "**risk management**".

What professional lenders call "due diligence" is a process that checks the truth ("veracity") of the proposed loan application and the proposal that underpins it. Due diligence has both quantitative and qualitative dimensions, meaning that all the numbers and calculations are examined, checked and tested, and all the statements are verified. Lenders have quite clear rules and decision-making procedures (credit committees, for example), so knowing the lender's criteria, requirements and processes in advance is the best investment a Champion can make *before* presenting a proposal. A lender's quantitative tests might include a requirement that there is always a reserve fund set aside that equals one year's future loan payment; the proposal's cash flow model can take that into account before a loan application is submitted. A lender's qualitative tests might include that the borrower must have certain credentials, income or wealth. When a Champion says that he or she has 10 years' direct experience supervising this or that technology or has never defaulted on a loan, the Champion must understand that those representations will probably be checked. Knowing requirements in advance can avoid wasted effort, direct a Champion to broaden the owner or management team and avoid situations where credibility becomes an issue.

Due diligence is basically a fact-checking process driven by the lender's criteria. Risk management is a process for which this guidebook's **What If** question has, hopefully, helped prepare the Champion. Lenders go through their own What If exercises with a particular point of view: they are looking for answers that place risk and responsibility on someone else, and they are looking to be convinced that that someone else can deal with the problem if it arises.

The point has already been made that Champions need to place themselves in the lender's position. By being able to deal with lenders' typical questions and issues regarding due diligence and risk management, a Champion will be in a position to anticipate problems and solve them if they arise.

#### Summary for Lenders

- ☑ Know in advance the lender's requirements with respect to type and length of loans, terms and conditions, indicative interest rates (i.e., today's rates), typical

restrictions and reserve requirements, debt-to-equity requirements and debt service tests.

- Know in advance the lender's requirements concerning the credentials and net worth of borrowers.
- Run the base case incorporating the lender's requirements as part of the model.
- Summarize the results in the executive summary, with an emphasis on debt service coverage.
- Prepare as an annex a set of credentials and documents that prove the case for the borrower. Have available the tax submissions, bank statements, deeds, etc. for any of the credentials or assets cited. Obtain the bank's application form well in advance and create a file with supporting documents.
- Prepare a risk-management table that lists the key risks (from the What If question) and how the risks are addressed.

What if the Champion's proposal cannot fulfil the bank's requirements? What if the Champion cannot meet the lender's requirements? Well, there a number of things to be done. This list definitely does not include making fictional adjustments to the cash flow projections or credentials. Things to be done include: exploring different combinations of debt and equity to improve the debt service performance of the cash flow projections; testing different assumptions regarding the terms of loans and the impact on cash flow (mortgage-style versus bullet versus equal principal payments, for example); expanding the owners' group to improve the credentials of the team as well as to expand the supply of equity and guarantees; and, discussing subordinated debt arrangements or other instruments that reduce the lender's risk and improve financial performance.

#### 5/ Customizing for investors

There are many different categories of investors. A few broad categories will suffice to separate their interests:

- Venture capitalists
- Financial investors
- Strategic investors
- Development investors
- Double- and triple-bottom-line investors

Venture capitalists seek opportunities in what are perceived as growing sectors using an ever growing roster of technologies and offering high profit (return) potential. "Clean technology" is an example of a venture capital focus. If a Champion has a proposal to produce a new building product that protects valuable existing surfaces from increasing rain or dryness (an example of an adaptation technology), such a proposal, properly prepared and presented, would engage the preliminary interest of venture capitalists (who gather at meetings known as venture fairs). Venture capitalists want to see growth

potential and management skill. They will exercise a great deal of control, especially if things do not go as planned. Their checklists especially emphasize size of potential market, competition, management's track record and how they can exit (a wonderful four-letter word that encompasses the ways that an investor can cash in its investment: listing on the stock market, sale of the company to a competitor or acquirer, buy-back by the original owners, re-financing).

Financial investors target specific returns (called "hurdle rates") and are prepared to accept specific risks in order to achieve those returns, which are higher than a lender may charge for interest. It is essential to understand the "hurdle rate" and "risk appetite" of such investors early in the discussions. Their due diligence will be similar to a lender's but they are more likely to examine a base case and a better case as well as a worse case scenario. Like venture capitalists, financial investors may want to exercise a lot of control if events roll out more slowly than planned or badly. They too would like to hear a Champion's ideas on "exits".

Strategic investors are interested in something in addition to financial return. They may be interested in a new market and see the proposal as an efficient way to become involved in that market. They may be interested in the knowledge and experience of the team. They may be interested in supplying a product or service. It is crucial (not just important) that all the cards are on the table before exploring such a relationship seriously. What does the strategic investor want to achieve? How is that consistent or in conflict with the proposal? How is that consistent or in conflict with the Champion's motivation and objectives? How will hidden agenda items be determined and controlled? How will the price of products and services be set and warranties enforced? These can be excellent relationships, often glowingly described as "partnerships", but like partnerships and marriage, they are to be entered into with eyes open and clearly defined terms and conditions.

Development investors are looking for the opportunity to create a specific impact, usually in a specific sector. They are investors (not donors) because they expect to be repaid. Their interests might include creating small enterprises, growing microfinance institutions, building the capacity to implement adaptation, renewable energy, organic farming or energy efficiency measures. They tend to be found in national, regional and multilateral development banks and tend to have very specific criteria. There is a great deal of generally available information on their websites and exploratory communication is relatively easy to arrange. The bad news is often embedded in the processes and requirements that come along with the interest. Decision-making can be slow and processing and documentation burdensome. The secret is to understand the requirements of development investors well in advance of making any commitment to this path.

Double- and triple-bottom-line investors are also known by other names, including socially responsible investors (and many other confusing subcategories and overlapping titles). They are individuals and organizations (including major foundations) that will accept a lower financial return with or without increased risk because of the blended value of the social and environmental benefits represented in a proposal. They can be

very broad in their interests and motivation (they may be high-net-worth families) and may be persuaded to consider new fields and innovations for very targeted investing.

How best to customize a presentation to an investor?

For those seeking financial return – venture capitalists and financial investors – keep the introduction simple with an emphasis on return and market potential, the team (experience, skills and track record) and the risks.

For the rest, it is difficult to know what might be interesting (“you never know where lightning is going to strike”) but a triple-bottom-line matrix (financial, social and environmental returns), combined with the team and the risks, will allow a quick screening by enabling organizations.

#### Session Feedback Notes

- Lecture and Slides or Handouts: Too long, too short?**
- Too detailed and complex ... too simple?**
- Lecture needed more (or less) of the following:**
- Exercise, if any, was helpful or distracting?**
- Discussion was relevant and helpful, or distracting?**
- Suggestions and Improvements:**
- What I might do differently when teaching this material:**

## Session Twelve – Training Others

### Session 12 Teaching Others

- Information Content: review of the information and techniques conveyed, methods used and exercises
- Technique Content: feedback and improvements ... suggestions on adaptations and usefulness
- Exercise: team feedback, author feedback, individual feedback ... inventory of materials needed

*Organizing Principle – “**Technology Transfer**” is about all the combinations of products, services and know-how available to fashion the desired result of sustainable development. “**Innovative Financing**” for technology transfer is more about connecting new combinations of actors and interests and applying tried and true approaches than it is about creating new, never-before-used products, services and tools.*

Session Objectives-to revisit prior eleven sessions and critique methods employed ... to critique case examples used and suggest improvements ... to discuss the importance of net-working and the possibilities of new forms of collaboration ... to reference other tools and techniques...

Structure- Discussion



## Sample Proposals

Sample Proposal	<b>“M”</b>	<b>“E”</b>	<b>“K”</b>	<b>“C”</b>	<b>“S”</b>
Location	Mozambique	Egypt	Kenya	China	Senegal
Concept	Sugar to Ethanol Production	Agriculture Waste to Electricity Demonstration	Bagasse to Electricity	Waste Water Treatment Demonstration	Solar Milling Demonstration
Technology	distillation of ethanol	anaerobic digestion	gasification- GTCC	radiolysis	photovoltaic

## Sample Proposal “M”

### A. Project description, type, location and schedule

Name of Project: Ethanol Substitution for Petrol

Technical summary of the project

Objective of the project	The objective of this project is to utilize the local sugar producing capacity of Mozambique to produce Ethanol to replace at least 5% of Mozambique’s petrol consumption.
Project description and proposed activities	<p>Rather than Mozambique’s sugar producers using the sucrose in C and B grade Molasses to produce additional crystalline sugar, ethanol can be distilled from these lower value materials. Ethanol can be substituted for petrol with little effect on most vehicles in concentrations of between 10-20% depending on the source of data.</p> <p>This project will work with the government of Mozambique through the public petrol company PetroMoc to develop local capacity for ethanol production, upgrade existing storage and blending facilities in Beira, and implement an ethanol blending program nation-wide for petrol.</p>
Technology to be employed	Ethanol Distillation from molasses is a basic process that has been successfully used for more than 30 years in countries like Brazil. The process of producing ethanol is based on the same principles of producing grain alcohol. There are pre-fabricated, turn key ethanol production units available in a variety of sizes from Brazil and elsewhere. The project will involve working with PetroMoc and the sugar manufacturers to select the appropriate distilling arrangements to meet Mozambique’s needs. See attached document for a more detailed overview of ethanol production from molasses.

Project developer	
Name of the project developer	Mozambique National Cleaner Production Center
Organizational category	State institution
Other function(s) of the project developer in the project	Technical advisor
Summary of the relevant experience of the project developer	MNCPC has worked on numerous projects with the UNIDO and UNEP including the development and submission of PINs, PCNs, and PDDs.

Address	Rua Valentim Siti Maputo
Contact person	Antonio Cumbane Leonardo GUIRUTA
Telephone / fax	+258 21417051
E-mail and web address, if any	<a href="mailto:ajcumbane@eng.uem.mz">ajcumbane@eng.uem.mz</a> and <a href="mailto:mncpc@tvcabo.co.mz">mncpc@tvcabo.co.mz</a>
Project sponsors	
(List and provide the following information for all project sponsors)	
Name of the project sponsor	PetroMoc
Organizational category	b.State owned Company
Address (include web address, if any)	Praca dos Trabalhadores, 9 Maputo  Contact Person: Mr. Eugenio Silva  <a href="http://www.petromoc.co.mz">www.petromoc.co.mz</a>
Main activities	Petromoc provides fuels and related products to consumers throughout Mozambique.
Summary of the financials	Need more here Total sales volume in \$ : 107.000.000 Profits in \$ : 80.131.000
Type of the project	
Greenhouse gases targeted	CO2 reductions from reduced combustion of petrol
Type of activities	Abatement
Field of activities	
c. transportation	Fuel switch
Location of the project	
Region	Subsaharan Africa / Southern Africa
Country	Mozambique
City	Country-wide
Brief description of the location of the project	Petrol is used throughout the country to fuel vehicles. The ethanol substitution will take place throughout the network of petrol provision.
Expected schedule	
Earliest project start date	2007
Estimate of time required	Time required for financial commitments: 12 months

before becoming operational after approval of the PIN	Time required for legal matters: 12 months (feasibility study, EIA) Time required for negotiations: 4 months Time required for construction: 7 months
Expected first year of verified Emission Reduction or CER / ERU delivery	Year: 2007/2008
Project lifetime	Number of years: indefinite
Current status or phase of the project	Prefeasibility study phase complete- Some work has been done by CASENA (EU supported) and negotiations are underway between PetroMoc and the sugar producers. Issues such as ethanol production facilities and price were discussed the first week of October, 2005 between PetroMoc and the sugar growers association.
Current status of the acceptance of the Host Country	Letter of Approval is under discussion or available
The position of the Host Country with regard to the Kyoto Protocol	The Host Country a. ratified the Kyoto Protocol

#### B. Expected environmental and social benefits

Estimate of Greenhouse Gases abated / CO <sub>2</sub> Sequestered (in metric tons of CO <sub>2</sub> -equivalent)	Annual: max 38,000 tonnes per year Up to and including 2012: 375,000 tCO <sub>2</sub> -equivalent Up to a period of 10 years: 750,000 tCO <sub>2</sub> -equivalent Up to a period of 7 years: 525,000 tCO <sub>2</sub> -equivalent Up to a period of 14 years: 1,050,000 tCO <sub>2</sub> -equivalent
Baseline scenario	CDM/JI projects must result in GHG emissions being lower than “business-as-usual” in the Host Country. At the PIN stage questions to be answered are at least: <ul style="list-style-type: none"> <li>• Which emissions is the proposed Clean Development Mechanism (CDM)/Joint Implementation (JI) project displacing? <u>This project is replacing CO<sub>2</sub> emissions that would have resulted from 100% petrol being used to fuel the vehicles instead of the proposed minimum of 5% ethanol.</u></li> <li>• What would the future look like without the proposed CDM/JI project? Ethanol has been discussed for a long time in Africa as a potential hedge against rising fuel prices and fluctuating sugar prices. However, little progress has been made in Mozambique or most African countries towards this end. The importation of petrol would likely continue as the vehicle fuel of</li> </ul>

	<p>choice in Mozambique.</p> <ul style="list-style-type: none"> <li>• What would the estimated total greenhouse gas (GHG) reduction be? <u>About 750,000 tons of CO<sub>2</sub>eq over the course of 10 years. This is conservative since 5% is the minimum percentage of blending looked at and that fuel consumption in Mozambique will likely increase significantly over the time period.</u></li> </ul>
Specific global & local environmental benefits	
Which guidelines will be applied?	Local environmental guidelines. Mozambique has developed a number of environmental regulations that would apply to this project (including the likely requirement for an EIA).
Local benefits	<p>There are numerous local benefits from this project.</p> <ol style="list-style-type: none"> <li>1. There will be more stable petrol prices in the country as ethanol will be produced from local production and not contingent on highly volatile fuel prices.</li> <li>2. Local sugar growers will be able to adjust production of ethanol based on petrol prices and sugar prices avoiding sole reliance on volatile sugar prices for revenues.</li> <li>3. Ethanol is a direct substitute for lead in petrol. Other studies, most notably in Ethiopia, have documented this in Africa. Lead is directly responsible for child developmental problems and all developed countries have removed lead from their petrol. Other lead substitutes such MTBE have been linked to other environmental problems.</li> </ol>
Global benefits	This project will reduce CO <sub>2</sub> emissions and reduce world dependence on the unsustainable use of fossil fuels.
<p>Socio-economic aspects</p> <p>What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? Indicate the communities and the number of people that will benefit from this project.</p>	All vehicle owners will likely benefit from reduced cost of vehicle fuel due to the locally grown and produced ethanol fuel reducing the higher costs of imported petrol. This will limit the economic impact of high global oil prices and stretched supply.

Which guidelines will be applied?	Local Guidelines
What are the possible direct effects (e.g., employment creation, capital required, foreign exchange effects)?	There will be direct benefits to local workers hired to operate the ethanol production plant and the storage and blending facilities. More exact estimates of the number of worker employed will become clearer later in the project development activities. It will also improve the balance of payment for Mozambique with its trading partners. More revenue once dedicated to importing petrol will now stay in the country as revenue for sugar growers and ethanol producers.
What are the possible other effects?	Sugarcane production is increasing in Mozambique and the addition of ethanol revenues will help finance additional investments which will hopefully include cogeneration plants which can help relieve the expected electricity shortfall in the SADC Countries.
Environmental strategy/priorities of the Host Country	In terms of its environmental priorities, Mozambique is looking to implement sustainable forms of energy development, as well as reduction of costly oil/diesel imports.

### C. Finance

Total project cost estimate	
Development costs	150,000 US\$
Installed costs	4 US\$ million
Other costs	US\$million
Total project costs	4.15 \$million
	<ul style="list-style-type: none"> <li>➤ Turn-key ethanol plant rated for about 100,000 liters per day = \$3,000,000</li> <li>➤ Upgrades to distribution and storage system = \$1,000,000</li> <li>➤ Cost of technical analysis for terms of reference = \$150,000</li> </ul>
Sources of finance to be sought or already identified	
Equity	\$4.15 million (likely split between PetroMoc and sugar companies)
Debt – Long-term	

Debt - Short term	
Not identified	
Carbon finance contribution sought	US\$2,625,000 over 7 years
Carbon finance contribution in advance payments. (The quantum of upfront payment will depend on the assessed risk of the project by the World Bank.)	TBD
Sources of carbon finance	Name of carbon financiers other than PCF that your are contacting (None)
Indicative CER/ERU or vER Price (subject to negotiation )	\$5
Total Emission Reduction Purchase Agreement (ERPA) Value	
A period until 2012 (end of the first budget period)	US \$1,875,000
A period of 10 years	US \$3,750,000
A period of 7 years	US \$2,625,000
A period of 14 years (2 * 7 years)	US \$5,250,000
If financial analysis is available for the proposed CDM activity, provide the forecast financial internal rate of return for the project with and without the CER revenues. Provide the financial rate of return at the expected CER price above and US\$3/ tCO <sub>2</sub> e. DO NOT assume any up-front payment from the PCF in the financial analysis that includes PCF revenue stream.  Please provide a spreadsheet to support these calculations.	A more detailed financial assessment will be prepared after further technical and financial data is made available.
Project Risks	The emission reductions provided here are quite conservative. A Carensa study estimated about 15% of petrol use could be substituted for with the ethanol production capacity from C and B grade molasses. This calculation assumes only five percent. While the percentage of total

petrol substitution may go up or go down as ethanol production, and petrol demand, fluctuate there will likely be an increase every year in the net ethanol production.

US EIA (Energy Information Agency) reported Mozambique used about 4,000,000 barrels of petrol a year (<http://www.eia.doe.gov/pub/international/iealf/table12.xls>).

There are about .373 tonnes of CO<sub>2</sub> per barrel of petrol used. If 200,000 (5%) of the petrol is replaced by ethanol you would see a net reduction in CO<sub>2</sub> emissions of about 75,000 tonnes of CO<sub>2</sub> per year.



**Sample Proposal E**

**Egypt National Cleaner Production Center**

**Using of Agricultural Waste for Production of Electricity by Using of Biogas  
Technology in Egypt**

**(Technical Proposal & Financial Proposal)**

**August 2008**

- **Date :** October 2008
- **Duration:** 2 years project
- **Name of Project:** Using of Agricultural Waste for Production of Electricity by Using of Biogas Technology in Egypt
- **Location:** Egypt
- **Champions Contact Information:**
  - Name: Hanan El Hadary, Director
  - Organization: Egypt National Cleaner Production Centre
  - Address: 26 A Sherif Street- Down Town – Cairo- Egypt
  - Country: Egypt
  - Tel-Fax: Phone:239 16154
  - E-mail address: h\_elhadary @link.net

- **Product or Service**

The project aims at producing biogas which could be a source for production of electricity. This will be done through establishment a pilot integrated biogas unit for generation of 1 MW electric power through the digestion of biomass. This would be through using the total amount of biomass of approximately 30000 tonnes/year which are mainly combination of rice straw waste, green leaves, cow manure and chicken manure.

The integrated biogas unit would enable the anaerobic treatment of the biomass in a closed digester system. The anaerobic digester system converts organic matter to methane-rich biogas. The generated biogas and the biomass are combusted in a boiler to produce energy. This energy substitutes the consumption of fossil fuel used for generation of electricity.

- **Technology**

Biogas typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. Biogas is comprised primarily of methane and carbon dioxide. Biogas originates from biogenic material and is a type of bio- fuel. Biogas is a product of the anaerobic digestion or fermentation of biodegradable materials such as manure or sewage, municipal waste, and energy crops. The methane in biogas gives it the ability to be used as a fuel. The combustion of which releases energy. It can also be utilized in modern waste management facilities where it can be used in gas engines to generate electricity. Biogas is a renewable fuel and electricity produced from it can be used to attract renewable energy subsidies in some parts of the world. Biogas is comprised of about 60% methane, 40% carbon dioxide and between 0.2% to 0.4% hydrogen sulfide

Biogas has been effectively used as a fuel in industrial high compression spark ignition engines. To generate electricity an induction generator can be used and is the simplest to interface to electrical grid. (Figure 1 shows the biogas technology used for production energy)

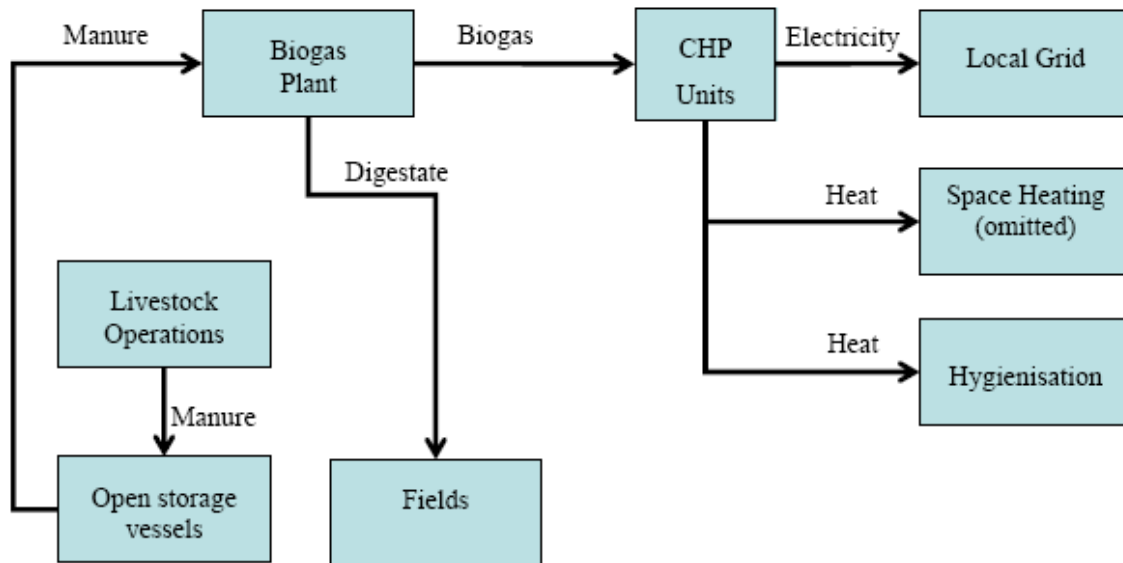


Figure 1 shows the biogas technology used for production energy

### Types of anaerobic digester:

#### 1- Covered Anaerobic Lagoon

Its consists of plastic impermeable flexible cover with manifolds designed to collect the gas produced.

#### 2- Complete Mix

Complete mix digester is an engineered tank either above or below ground typically constructed of either steel or concrete that is heated, complex mix digesters are appropriate for all climate conditions.

#### 3- Plug Flow

Plug flow is an engineered, heated, rectangular tank with a fixable cover for biogas collection, they are best suited for operate in any climate condition because they are internally heated, plug flow digesters can operate.

- **Customer and Clients**

The main customers for the project are the industrial enterprises which generates huge amount of agricultural waste which could be used as a source for renewable energy

by converting them to biogas (e.g. farms, agro-food industries and produced of pharmaceutical and medical herbs).

- **Current Status**

Beside the marketable part of the agriculture products which could be used for food, feed, oil, fibre, medicine and other industrial products, there are almost 15-20 million metric tones of low cost residues available annually with very high energy content. A study supervised by Industrial Modernization Center (Min. Industry and Trading), the Center for Energy Studies, Cairo University, has cited a survey of the biomass (agricultural residues) in Egypt using residue-to-product ratio method. The distribution pattern of the different crops residues (mostly lignocelluloses materials) have revealed that C3 plant, e.g., rice straw (4.3 million tones) are mostly dominating North and East of Delta areas (Kafr El-Shiekh, Sharkia, Dakahlia, and Gharbia), as well as Behira (West of Delta). C4 plant, e.g., corn stover (3.3 million tones), are found in Middle of Delta (Monofyia), West of Delta (Behira), East of Delta (Sharkia), South of Nile valley (Menia). Sorghum stalks (0.892 Million tones) as a C4 plant are dominating far south of Nile valley (Assuit and Sohag) as well as sugar cane residues (3.5 Million tones) in Qena and Aswan. It is appear there is a good chance to use the crops residues as a tool for local rural development by introducing biogas technology by using rice strew as source for electricity by using bio-gas techniques.

- **Project Size, expected schedule, cost, divided between planning, construction or pre-operation and operation**

The present project is consider as small size project and expected to take two years of implementation and monitoring. The planning of the project will take 4 months and construction 1 year and preparation four months and full operation will take four months.

- **Current needs and request**

The current needs and request to implement the project could be summarized as follows:

- 1- Technical Support (technical experts, technology selection, technology installation, training etc)

The integrated biogas unit should include the following equipment:

1. Digester, with its utilities as follows:

- 1.1. Secondary treatment.
- 1.2. Reverse osmosis.
- 1.3. Storage system.

2. Gas holder.

3. Boiler.

4. Turbine.

5. Generator (power generations synchronized with grid).

- 2- Financial Support (funding for starting project and project implementation)

- **Market conditions**

There is high demand for the electricity in Egypt with the new pricing system for Energy which raised dramatically the prices of energy used in industrial and domestic uses. So the present project would provide a renewable and sustainable alternative for energy which could be absorbed and diffused in the Egyptian market.

- **Operating conditions**

The project will be implemented in SEKEM Company, and the company will fully responsible for the operation of the project at its premises. The ENCPC will supervise the implementation and the operation of the project.

- **Regulatory conditions (including all required approvals)**

According to the Egyptian Environmental Law (Law 4 for 1994) all the new projects must conduct an intensive environmental Impact Assessment Study for their activities and must get approval from the Egyptian Environmental Affairs Agency (EEAA) otherwise the projects will be rejected. The current project has got approval on its EIA study which presented to EEAA. This would be used as the background for all the required legal approvals required for the project.

- **Owners and sponsors**

The project will be managed by the Egypt National Cleaner Production Centre in close cooperation with SEKEM which will be considered as the owner of the project. SEKEM Company is an Egyptian company was established in 1977 on an area of 70 hectares. The company produces an extensive variety of consumer products in the fields of natural pharmaceuticals, organic food and textiles, information technology and ecological services. The products are made from ingredients from biodynamic farming. This method undertakes to restore and maintain the vitality of the soil and food as well as biodiversity.

- **Team**

The team of the project will include of the following agencies:

- Egypt National Cleaner Production Centre as the main Executing Agency
- United Nations Industrial Development Agency (UNIDO) as supporting international agency
- Ministry of Agriculture – Agricultural Research Institute
- SEKEM Company

The project management will hire national and international technical experts to support the implementation of the project.

- **Stakeholders**

- Ministry of Trade and Industry
- Ministry of Agriculture – Agricultural Research Institute
- Ministry of Environment – Egyptian Environmental Affairs Agency
- United Nations Industrial Development Organization
- Industrial Modernization Centre (IMC)

- The Center for Energy Studies, Cairo University
- Private Sectors

- **Governance and Management structure (decision-making, authority and responsibility)**

Under the supervision of UNIDO (United Nations Industrial Development Organization), the project is managed and implemented by the Ministry of Trade and Industry and its Egypt National Cleaner Production Center in close cooperation with the local and international partners as follows: Egyptian Environmental Affairs Agency (EEAA), Ministry of Agricultural (Agricultural Research Institute) and SEKEM Company. The responsibility of each partner could be summarized as follows:

***Ministry of Trade and Industry- Egypt National Cleaner Production Center***

- Joint Project Management with UNIDO
- Coordination with other stakeholders
- Technical Support & capacity building for concerned local stakeholders
- Dissemination of information among the other stakeholders

***Egyptian Environmental Affairs Agency***

- Contribution to feasibility study and data on agricultural waste
- Contribution to project technical support and capacity building activities
- Promotion of the results
- 

***United Nations industrial Development Organization (UNIDO)***

- Joint Project management with the Ministry of Trade and Industry and the Egypt National Cleaner Production Centre
- Technical support for implementation of the project

***Ministry of Agricultural (Agricultural Research Institute)***

- Contribution to feasibility study and data on agricultural waste
- Contribution to project technical support and capacity building activities
- Promotion of the results

***SEKEM Company***

- Act as the owner of the project
- Contribute financially for the implementation of the project
- Provide the location and place for project implementation
- Provide the available information on their process

- **Implementation steps and plan**

The implementation plan of the project will contain main following steps:

- Identify the current situation for rice strew management in Egypt
- Identify the potential application and use of the rice strew as source for biogas
- Cost Benefit Analysis for the project
- Identify the required Technology(Biogas Plant)
- Implementation of a pilot Biogas plant
- Operation and Monitoring of implementation
- Final evaluation and documentation of project

- Awareness raising and information dissemination for the Egyptian stakeholders

- **Cash Flow and Schedule details**

**Required investment**

Equipment	Required Investment	
	U.S. \$	EGP Equivalent*
Production unit	1.200.000	6.360.000
Installation coast estimated	180.000	954.000
<b>Total</b>	<b>1.380.000</b>	<b>7.341.000</b>

\* Conversion rate taken at U.S. \$ 1 = EGP 5.3

**Operating Costs**

Table (2.2) presents the operating cost required to produce one Kw/hr of electricity after implementing the electric generation unit.

It is seen from the table that the production cost is about 1,681.58 EGP/ Ton.

**Production cost per KW/hr electricity**

Input	Unit(Kg)	Cost, EGP
Rice straw	50.0	0.10
Fuel	0.01	0.01
Electric Power	0 .02kWh	0.01
Depreciation	15 years	0.08
Other Industrial Costs		0.02
Administrative Costs		0.01
<b>Total, EGP/Ton</b>	<b>0.23</b>	

- The cost of Rice straw = 2 EGP/Ton
- The price of KWh = 0.334 EGP/ KW/hr

**Estimation of Profit**

The sales cost of KW/hr is about 0.334 EGP. This means that the total profit per KW/hr will amount to about 562.84 EGP/ KW/hr.

The production will be 6.480.000 KW/hr/y corresponding to a yearly profit of EGP 6.480.000 × 0.104 = 673.920 EGP/ year

**Payback Period**

It is clear from the above investment and operating cost that the payback period would be

$$\frac{7.341.000}{673920} = 10.89 \text{ years}$$

- **Impacts and Returns**

The integrated biogas unit requested by the company should enable the anaerobic treatment of the biomass products, which include rice straw, green leaves, cow manure, and chicken manure. The anaerobic digester system converts organic matter to methane-rich biogas, which will be captured and combusted in a boiler for renewable power, thus converting its methane content into carbon dioxide and thereby reducing its greenhouse gas effect. Biomass will be used as input to the boiler for electricity generation. This supplementary fuel will enable the unit to continuously generate energy even at times of failure of the anaerobic digester or non-availability of methane-rich biogas. The integrated biogas unit requested should be fully developed.

- **Sensitivity (what if?) analysis**

The sensitivity of the project could be the following:

- Shortage in the feedstock of rice strew
- Maintenance or Spare Parts problem with the biogas unit.
- Cost of Production of biogas is high comparing to other sources of energy
- Sustainability

- **Risks and measure to handle them**

- 1- Shortage in the feedstock of rice strew

This could be avoid by establishment a long term agreement with the farmers for the delivery of their rice strew in close cooperation with the Ministry of Agricultural

- 2- High cost of maintenance or spare parts problem with the biogas unit.

This could be handling through a long-term contract with the technology supplier to ensure availability of full support for maintenance and providing of spare parts. In addition a high technical training for the unit management on maintenance measures should be provided

- 3- Cost of Production of biogas is high comparing to other sources of energy

This could be handed by providing economic incentive to keep ruining the unit (tax free etc).

- 4- Sustainability:

It is very crucial to ensure the sustainability of the project. This could be done by introducing the project as a Clean Development Mechanism (CDM) Project which will provide significant environmental and economical benefits.



## **Sample Proposal K**

### SUGAR FACTORIES SURPLUS BAGASSE UTILIZATION FOR CO-GENERATION: A CENTRALIZED CLEAN POWER OPTION FROM THE WESTERN KENYA SUGAR MILLS CLUSTER

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By Mr. Kelvin Khisa, Kenya National Cleaner Production Centre (KNPC)

**Date:** August 11, 2008

**Name of Project:** Sugar Factories Surplus Bagasse Utilization for Co-generation: A Centralized Clean Power Option from the Western Kenya Sugar Mills Cluster.

**Location:** The Western Kenya Sugar Mills Cluster is located on the Western part of the country and spreads across Western and Nyanza provinces. The cluster is located within the Lake Victoria Drainage Basin and comprises of five sugar mills namely Chemelil, Nzoia, South Nyanza, Muhoroni and West Kenya. This is a rain-fed sugar belt. Due to their proximity to each other, they can easily benefit from a centralized co-generation clean power plant centrally located within the cluster.

**Champion's Contact Information:** The Champion of this Project is the Kenya Sugar Board (KSB). It is mandated to regulate, develop, and promote the Kenyan Sugar industry; co-ordinate the activities of individuals and organizations within the industry as well as facilitating equitable access to the benefits and resources of the industry by all interested parties. It does this using a portion of the Sugar Development Fund (SDF) that is financed through a levy that is charged at 7 % of the value of both locally manufactured and imported sugar. It is therefore within its mandate to assist in the establishment of this planned centralized co-generation power plant.

**Product:** This project seeks to make use of excess bagasse from the five listed sugar mills for purposes of generating clean power through co-generation. It is estimated that the Western Cluster sugar mills only use 54% of the 1,290,640 tones of bagasse generated annually for steam and electricity generation for internal consumption. The remaining 46% of the bagasse is heaped in "mountains" in company yards, a development that denies these mills an additional revenue stream. It is estimated that exploitation of this excess bagasse for power generation presents an expansion potential of up to 60 MW. These factories have installed cane crushing capacities of 3850, 3000, 2,800, 2200 and 3,000 tones cane per day (TCD) respectively. The amount of generated bagasse is approximately 40% of the total quantity of cane processed. A centralized co-generation power plant will help improve the profitability of the cluster based sugar mills, as they will be in a position to sell surplus power to the national grid.

**Technology:** The Biomass Integrated Gasifier / Gas Turbine, Combined Cycle technology (BIG/GTCC) promises high efficiencies and lower electricity costs than conventional biomass – fired condensing steam turbine technology. BIG/GTCC systems

are capable of producing up to twice as much electricity per unit of biomass consumed and do have lower capital investment requirements per kW of capacity than Condensing Extraction Steam Turbine (CEST) systems, the present day commercial technology for electricity production from biomass. The significant levels of biomass available in the cluster as by-products of sugarcane processing as well as the trash, tops and leaves of sugarcane offers a potentially attractive application for BIG/GTCC systems. The basic elements of a BIG/GTCC power plant include a biomass dryer (fueled by waste heat), a gasifier for converting the biomass into a combustible fuel gas, a gas clean up system, a gas turbine-generator fueled by combustion of the biomass derived gas, a heat recovery steam generator (HRSG) to raise steam from the hot exhaust of the gas turbine, and a steam turbine generator to produce additional electricity. An appropriately sized BIG/GTCC (based on the findings of the feasibility study) will be centrally located to serve all sugar mills within the cluster.

**Current Status:** Presently, an average of 26 MW co-generated power is being produced by the five sugar mills in the cluster. According to the Kenya Sugar Board (KSB), there is an expansion potential of up to 55 MW in the cluster if the existing excess bagasse can be utilized for clean power generation.

**Project Size, Expected Schedule and Cost, divided between Pre-operation and Operation Activities:**

This project will involve the erection and commissioning of a BIG/GTCC bagasse power plant that will be centrally located and with adequate capacity to serve all the sugar mills in the cluster. The project will also include the modernization of all the five sugar factories in the cluster to improve efficiency of bagasse use in sugar cane processing; setting up of infrastructure for bagasse transport from cluster factories to a centralized power plant; and investments in transmission lines from the centralized power plant to the national grid. This project is estimated to cost a total of 10 Million USD. 25% of this amount will cover the pre-operation activities with the rest covering the operation activities of the project.

**Current needs and Request:** A total investment of 10 million USD is needed for this project. The Kenya Sugar Board (KSB) is prepared to contribute 25% (2.5 million USD) towards the project on behalf of the sugar factories, cluster based sugar factories will jointly on equal terms raise 5 % (0.5 million USD) of the cost while the rest 70 % (7 million USD) will be requested from the bank as a loan with a fixed term of no less than 10 years.

**Market Conditions:** With over 60% of Kenyan electricity being sourced from hydro sources from one major drainage basin, its reliability is subject to the vagaries of weather. The country enjoys excess power during the wet season and very limited power during the dry season. The country needs to expand its energy mix so as to assure a sustainable and reliable supply all the year round. Additionally, the power demand of the country far exceeds its supply capacity. Kenyans use up to 1050 MW of electricity at peak hours, just 50 MW shy of the country's maximum capacity, and the demand is growing at 8%

annually. There is therefore adequate market for clean energy from co-generation sources. This will not only improve livelihoods but also conserve the environment.

**Operating Conditions:** In Kenya, there is nothing at present to constrain entry into the power supply by the sugar factories located in the western cluster. The Energy Act 2006 provides for the use of standardized equipment based on standards set by the Kenya Bureau of Standards (KEBS). An agreement between the Government of Kenya and the World Bank requires that any new investment exceeding 10 million USD must go for international competitive bidding. The Act provides for a penalty clause in the Power Purchase Agreement (PPA). These penalties are payable in the event of a supplier failing to supply power as agreed. Depending on the efficiency of the sugar co-generation plants, they may be quite vulnerable to such penalties.

**Regulatory Conditions (including all required approvals):**

The Electric Power Act of 1997 provides for the Minister responsible for energy to issue licenses for the generation, transmission and distribution of electric power to any person or organization that meets the requirements for granting such license. Qualification for the issuance of a license shall be determined for each application by the Electricity Regulatory Board (ERB). The board is set to regulate the generation, transmission and distribution of electric power and its powers include setting, reviewing, and adjusting electricity tariffs. The board also ensures that there is free and fair competition in the industry.

**Owners and Sponsors:** The proposed power plant will be jointly owned by sugar factories located in the cluster under the umbrella of the Kenya Sugar Board (KSB).

**Team of Stakeholders:**

Kenya Sugar Board (KSB)  
Kenya Sugar Research Foundation (KESREF)  
Kenya Sugar Manufacturers Association (KESMA)  
Electricity Regulatory Board (ERB)  
Kenya Power and Lighting Company (KPLC)  
Kenya Private Sector Alliance (KEPSA)

**Governance and Management Structure (decision-making, authority and responsibility):** The Kenya Sugar Board (KSB) will oversee the operations of the power plant on behalf of the cluster factories through a representative board. Each of the factories will be represented at the board for purposes of ensuring transparency and accountability.

**Implementation Steps and Plan:**

The following steps will be followed in the implementation of this project:

- ⇒ Review of the Government policy to establish how co-generation is recognized as a renewable energy option that uses locally available resources;
- ⇒ Working with sugar factories to evaluate their energy requirements and optimization of the same through proper investments in energy efficiency;
- ⇒ Enabling the Kenya Power and Lighting Company (KPLC) to spell out its energy demand based on reliable forecast in order to establish its base load requirements over time;
- ⇒ Ensure the signing of a memorandum of understanding (MOU) between KPLC and the power plant;
- ⇒ Conducting of a feasibility study for the planned project;
- ⇒ Signing of formal power purchase (PPA) agreement between KPLC and the management of the power plant;
- ⇒ Raising of funds for investment in the power plant using the PPA as the bank guarantee;
- ⇒ Making arrangements to meet statutory requirements such as Environmental Impact Assessments (EIAs);
- ⇒ Execution of a detailed project design;
- ⇒ Carry out a tendering exercise for the supply of the technology;
- ⇒ Erecting and commissioning of the power plant

### **Cash Flow and Schedule Details**

This will be determined upon accurate determination of the cost of the power plant.

### **Impacts and Returns**

Use of co-generation by cluster based factories will help reduce emissions that contribute to the challenges of climate change. Additionally the excess bagasse that was otherwise considered as waste will start acting as a revenue stream to improve livelihoods.

### **Sensitivity (what if?) analysis**

These have been addressed in the risks and risk containment section below.

### **Risks and risk containment**

1. Design and Technology Risks: will the proposed design and technology perform as anticipated at the appropriate efficiency levels? Obtain quality participants, who are knowledgeable regarding co-generation technologies and design considerations;
2. Construction Costs rising: obtain insurance coverage against cost escalation, or assign fixed price contracts with the construction management firm;
3. Delays in project completion: Obtain insurance protection or contract protection to assure that the project is completed on time;
4. Fuel Supply and Cost: sign long term contracts with fuel suppliers;

5. System performance: obtain performance guarantees from the manufacturer, or insurance coverage from appropriate insurance companies;
6. Financing costs: negotiate appropriate arrangements with the financing sources so that escalations of financing costs are minimized;
7. Tax regulations: keep track of current trends in regulatory initiatives in the country;
8. Environmental and other regulations: keep track of the appropriate regulatory changes anticipated, and seek expert service from reputable organizations.

## Sample Proposal C

### CORAY Industrial Waster Water Treatment Co., Ltd.

- **Date:** August 2008
- **Name of enterprise:** CORAY Industrial Waster Water Treatment CO., Ltd.
- **Location:** Beijing, China
- **Champion's contact information:** Dr. Liu Zhengping, Managing Director of CORAY Company; Huaye Building 2206, TUS Park, Haidian District, Beijing 100084, China; Tel: +8610 62795171; Fax: +8610 62795182; Email: [zpliu@itcc.com.cn](mailto:zpliu@itcc.com.cn)
- **Product or service:** A solution to industrial waste water treatment called CORAY-Solution which can replace the incinerator.
- **Technology:** CORAY-Solution combines the radiolysis technology with the conventional water treatment technology to reduce the cost to the bottom.
- **Customers/clients:** CORAY-Solution is suitable for two kinds of potential clients: The first kind of client must be facing the problem that they have to use incinerator to treat the contamination of the sewage which is hard to be de-compounded by Bio-methods. While, for the other kind of client, although they haven't the incinerator, they are forced by the more and more strict policies of environmental protection to find out the appropriate solution to treat the emitted debiodegradable contaminations. These clients are mainly from the industries of chemical, textile and dyer, paper-making, pesticide, leather and etc.
- **Current status:** The technology development has been completed. CORAY and China Petroleum Jilin Petrochemical Co., Ltd. have entered into the primary agreement on the demonstration project. The experiment at the early stage of the project has been completed.
- **Project Size, expected schedule and cost:** budget of the project is totally Euros 1.1 million and the open for business will begin three months later after the investment is put in place. Please see the following table for details:

Activity	Schedule	Cost (Euro)
<b>Planning tasks</b>		
- Permits	Year 0, month 9	5,000
- License Agreement	Year 0, month 9	300,000
- Recruiting	Year 0, months 9-12	10,000
- Rent Office (1 <sup>st</sup> year)	Year 0, month 8	50,000
- Open for Business	Year 1, month 1	
<b>Demonstration Plant</b>		

- <b>Demonstration Contract</b>	Year 0, month 9
- <b>Designing of Process</b>	Year 0, months 1-6
- <b>Engineering Design</b>	Year 0, months 7-9
- <b>Purchasing &amp; Installation</b>	Year 0, months 10-12
- <b>Training</b>	Year 1, month 1
- <b>Start-Up &amp; Test run</b>	Year 1, months 2-6
- <b>Optimization</b>	Year 1, months 7-9
- <b>Delivery</b>	Year 1, months 10

- **Current needs and request:** The total investment into the project is Euros 1.1 million. The investor will put into Euros 550 thousand and hold 50% shares of CORAY.
- **Market conditions:** In China, all those industries emitted more than 10 million tons of sewage annually and the worse is the number is still increasing ceaselessly. There have been over 1000 users of waste water incinerators at present which are also our most potential targeted clients in the market. Moreover, a series of policies issued by China government recently also enlarge the market.
- **Operating conditions:** All the equipments provided by CORAY are from the professional equipment manufacturers. The key equipment electronic accelerator can be supplied by at least five manufacturers in China, which have already been widely used and certified to be safe and reliable by practices.
- **Regulatory conditions (including all required approvals):** There's no special regulation to restrict the operation of CORAY. CORAY can enjoy the tax preferential policies from the government.
- **Owners and sponsors:** at the present Coway International TechTrans Co., Ltd (hereinafter as Coway) is the sole sponsor. Coway is the leader of technology transfer in China, which holds the exclusive license of the technology for CORAY-Solution and agrees to transfer it to CORAY. Coway has a ready-made network which can provide CORAY with abundant client resources as well as the necessary supports from the governments. Coway will become one of the shareholders of CORAY.
- **Team:** The developer of CORAY-Solution will become a member of CORAY'S technical team. The executant will recruit other necessary personnel for sales and service, design engineering, admin. and financial.
- **Governance and management structure:** Dr. Liu Zhengping will be appointed as Managing Director for the whole operation of the company. Professor Wang Jianlong will take charge of the technical department and leader of the sales department will be recruited through head-hunting company.
- **Implementation steps and plan:** After the investment agreement is signed and the

company CORAY is established, Coway will transfer the exclusive license for technology for CORAY-Solution to CORAY. The executant will make recruitment for CORAY and appoint the location for CORAY'S office. Meanwhile, CORAY will take over the sample project in the primary agreement.

- **Cash flow and schedule details:** the equipments for the sample project will cost a bigger amount of money at the beginning of the establishment of the company. But this amount of capital will be returned to CORAY by the project owner after the successful delivery of the sample project. For the future projects, the expenses of the equipments will be prepaid by the clients who will not obviously influence the cash flow. Base case shows that net cash flow of CORAY will be realized from the second year of opening of the company. Please refer to the part of financial analysis for details.
- **Impacts and returns:** Three environment benefits brought by CORAY-Solution: Firstly, CORAY-Solution provides a cost-acceptable plan for the persistent pollutants to reduce the Illegal emissions. Secondly, compared with the incinerators, this solution can save a considerable quantity of fossil fuel. Lastly, CORAY-Solution avoids the emissions of GHG and other harmful air aroused during the incineration. The radiation equipments applied in CORAY-Solution is very safe. The industrial electronic accelerators have already been widely employed in the fields of food packaging, pharmaceutical, tire production and etc. in which they are verified to be safe and reliable.
- **Risks and measures to handle them:**
  - Since new technologies are adopted in CORAY-Solution, the clients may hold a wait-and-see attitude because they don't know much about the new thing. The sample project will verify the reliability of the technology to the public. Meanwhile, we also include a budget for the advertisement/ propaganda in the financial planning.
  - Considering the market-entry risk of CORAY-Solution, we make a conservative assessment on the sales in the financial forecast. The sample project will be considered as the first achievement of CORAY.
  - Provided the sample project failed, CORAY would get into a financial crisis and the negative reputation will bring a deathblow to the company. To avoid a failure due to technical factors, we've made a cautious experiment certifying the technical plan is feasible.
  - Other risks include the quality of the key equipments and the team experience which can be controlled or settled by effective management.



## 1 What

### 1.1 Product and service

CORAY is aiming to provide a completely new solution to for the industrial sewage treatment called CORAY-Solution. This plan is suitable to treat complex-component industrial sewage which includes debiodegradable contaminations, especially for the industrial sewage containing toxicant to replace the traditional waste water incinerators.

Incinerators are commonly used to treat the sewage which contains debiodegradable pollutants, but this method consumes a great deal of fuel which makes it very costly and emits a lot of GHG during the incineration. CORAY-Solution will save the fuel, reduce the cost and bring an additional GHG emission reduction. Take an acrylonitrile factory for example, one ton waste water including virulent compound is aroused by one ton of acrylonitrile. Due to the high toxicity of the sewage, biodegradation cannot play its role so incinerator has to be used. 100kg of fuel will be consumed by per ton of sewage and the total cost for treatment will be as high as RMB300 for per ton of sewage. The incineration will produce CO<sub>2</sub> and other pollutants like NO<sub>x</sub>, SO<sub>x</sub> and etc. While, if the CORAY-Solution is employed , the treatment cost will be reduced to less than RMB100/ton of waste water. CORAY-Solution only uses electricity which realizes naught gas emission but the energy efficiency is much higher than the incineration.

CORAY-Solution includes the process and equipments. CORAY can provide the clients with services from the engineering design to Turn-Key. CORAY doesn't supply any equipment separately. Those equipments should be purchased by CORAY or clients themselves from the professional equipment manufacturers.

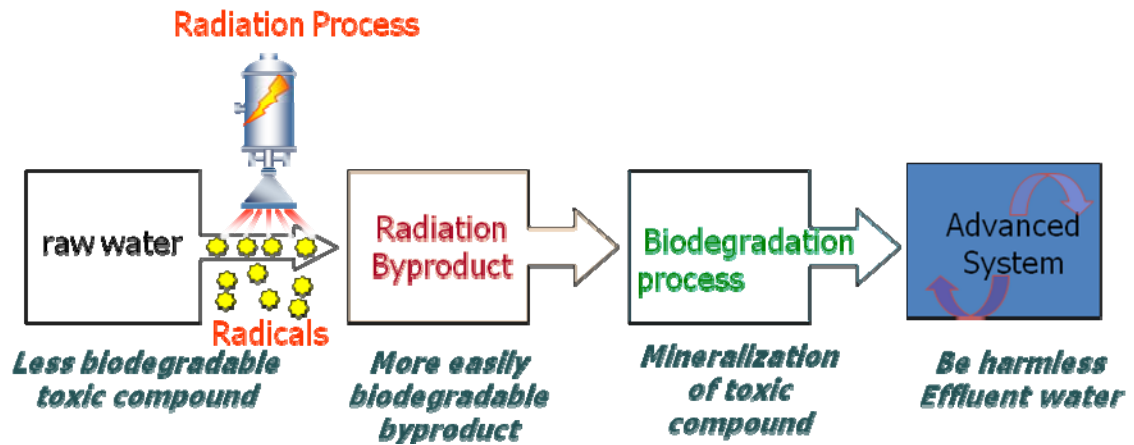
### 1.2 Technology

CORAY-Solution applies radiolysis technology.

High activity groups (e.g., .OH and the Hydrated Electron) generate in the water by the irradiation of  $\gamma$ -ray or high performance electronic beams, and then an oxidation/reduction reaction is made with the pollutants to make them degraded or converted. Theoretically, the irradiation can make all the pollutants decomposed throughout as long as it is adequate with a high strength. However, it will cost more energy and time to do this so it is not more economical than the Incineration technology.

To reduce the cost of waste water treatment maximally, “to minimize quantity of the irradiation to settle the key problem” is emphasized in CORAY-Solution meaning that the solution firstly use the irradiation technology to covert the most troublesome pollutants into bio-degradable biomasses and then use the conventional water treatment technology for a further treatment of the remaining waste water after the irradiation. In another word, CORAY-Solution

is a plan combining irradiation technology with conventional technology together. This solution is co-developed by the project owner, Coway International TechTrans Co., Ltd and Tsinghua University. Coway possesses the exclusive licensing rights of this technology.



### 1.3 Clients

CORAY-Solution is suitable for two catalogues of potential clients: The first kind of client must be facing the problem that they have to use incinerator to treat the contamination of the sewage which is hard to be degraded by bio-method. While, for the other kind of client, although they haven't the incinerator, they are forced by the more and more strict policies of environmental protection to find out the appropriate solution to treat the emitted debiodegradable contaminations. These clients are mainly from the fields of chemicals, textile and dyer, paper-making, pesticide, leather and etc.

## 2 Where

### 2.1 Market Status

CORAY will be set up in Beijing China, facing both China and overseas markets. As a quickly growing emerging market, China outputs a large emission of industrial waste water. According to National Bureau of Statistics of China, the totally the waste water emitted by the industries of chemical, textile and dyer, paper-making, pesticide, leather and etc. exceeded 10 billion tons in 2005 and the worse is among them, 10% of the emission failed to meet the emission standard. Along with the development of the economy, the emission is always increasing and it is estimated that the waste water of the foresaid industries will break through 15 billion tons annually in 2010. A more direct figure shows that there are at least 1000 units of waste water incinerators are being used in China. These users of the incinerators are the main targeted clients of ours. Further more, CORAY-solution can also be employed in the oversea market. We now mainly focus on China market with great energy but an oversea market developing plan will be included into the proposal when the time is right.

### 2.2 Policy conditions

There's no special regulation to restrict for the products and services of CORAY. On the contrary, CORAY can enjoy the tax preferential policies from the government- business income taxation free policy for the beginning three years of the operation and the half taxation preferable policy for the next three years. It has been recognized worldwide that China is very friendly to the overseas capital. And the China government becomes more and more active on the problems of environment protection and energy-saving to make up the serious environmental pollution and waste of energy aroused by only emphasizing the increase of the economy in the past.

- Make out the definite energy-saving and emission-reduction target( in 2010, energy consumption should be reduced by 20% and the total emission of the main pollutants should be reduced by 10% for per unit GDP)
- Bring energy-saving and emission-reduction into the Examination System of local government officers and made the Accountability System.
- A series of new laws have been issued and more regulations and policies are being making at the present. The monitoring of the governments will become more strict with a better maneuverability meaning that the delinquents will facing greater risk and more strict punishments.
- More strict emission standards has been applied
- These policies force the more and more factories to treat their waste water carefully, which also bring a more extensive market for CORAY-Solution.

### 3 Who

#### 3.1 Executant

##### **Dr. Zhengping Liu**

Dr. Zhengping Liu is the main executant of CORAY.

Dr. Zhengping Liu is Executive Vice President of Coway International TechTrans Co., Ltd. and deputy director of International Technology Transfer Center ( ITTC in short ) of Tsinghua University. He has rich experience in technology management, including technology evaluation, technology markets, technology commercialization & transfer, especially focused on environmental protection and clean energy technology. In recent years, he has actively participated in technology transfer projects related to CDM (Clean Development Mechanism) and global climate change.

In 2001, Zhengping Liu created Shanghai Co-way International Technology Transfer Center Co., Ltd, which is the first market-oriented technology transfer consulting organization in China engaged in international technology transfer and relevant consulting services, and he is the CEO of Shanghai Co-way International Technology Transfer Center Co., Ltd.

From 1994 to 2001, Zhengping Liu worked for China Aviation Industry Corporation, holding management positions from Chief Project Manager to Department Director. Previously, as a research fellow, he worked for the Chinese Academy of Sciences, responsible for research, technology development and industry liaison on environment science and environment protection technology. During the past 6 years, he has supervised or participated in over 30 technology transfer and technology licensing projects with industry, helped more than 100 overseas companies start or develop their business in China through providing market research and related consulting service.

Zhengping Liu was granted his Ph.D. degree in natural resource and environment science at Russian State Hydro-meteorological Institute in 1992, and he received his graduate education in China Science and Technology University.

##### **Mr. Jianyong Liu**

Graduated from Sichuan University in 1998 as a bachelor of engineer, Mr. Jianyong Liu joined in Coway International TechTrans co., Ltd. in 2003 and took responsibility on the planning and implement of a series of projects regarding fields of energy, environment, material, chemical and etc as project manager. From 2004, he takes charge of the business development and planning for the above fields as director of license & development department and accumulates abundant experience for project implement. He is also one of the main planners as well as the executants of the project in the proposal.

Besides, in the past years, Mr. Jianyong Liu has been responsible to establishing several online platforms for technology transfer and e-business which include “technology transfer service platform for small and middle Chinese enterprises” sponsored by the Ministry of Science and Technology of China, China international tech transfer platform for chemical and material

[www.kemtek.com.cn](http://www.kemtek.com.cn) and Patent license of China [www.chinapatentlicense.com](http://www.chinapatentlicense.com) aiming to promote Chinese advanced technology transfer internationally.

Mr. Jianyong Liu has acquired the Lawyer qualification of China and he is always focusing on the IP trade and protection during the technology transfer.

### 3.2 Owner

Coway International TechTrans Co., Ltd., the leader of technology transfer in China, was established by her shareholders Tsinghua Holding Co., Ltd., KWEICHOW MOUTAI CO., LTD, HEBI COAL INDUSTRY (GROUP) CO., LTD and Beijing Chengkun Investment Co, Ltd. with a registered capital of RMB 50 million.

Coway, which has successfully implemented lots of projects during the six years since it was established, is mainly dedicating to the technology development and technology transfer in the fields of climate change, energy and environment protection. In 2006, Coway won International Technology Transfer Award issued by the IPTEC committee in IPTEC European TechTrans Alliance Conference 2007 which was held in CANNES, France.

Coway has the exclusive license of CORAY-Solution. As one of the main mode for technology transfer, Coway is expecting to establish the company CORAY with other investors and would like to transfer the exclusive license to CORAY. The extensive pipelines of COWAY covering the governments, research institutes and industrial corporations can provides CORAY abundant client resources and strive for the support of the governments in policy and capital. Besides, CORAY can also acquire the technical assistance from the strong networks.

### 3.3 Team

The R&D team of CORAY-Solution has made a promise to enter the R&D department of CORAY. The key member of the team, Dr, Wang Jianlong, is a professor of Nuclear Institute of Tsinghua University who is dedicating to the research on the waste water treatment. Except for mastering civilian nuclear physics technology, he also has many research achievements in biological treatment technique. Besides, the technical backgrounds of his team members are very balanced which is crucial to the R&D work of CORAY-Solution combining the nuclear physics technology and conventional technology. In another word, it is the team with such technical background makes CORAY-Solution possible. The executant Dr. Liu will build up the sales and service teams via recruiting agencies..

### 3.4 Participants

#### 3.4.1 Organizations providing similar products or services

A Russian company is providing the similar product. They use irradiation for waste water treatment. As foresaid, it isn't economical to only use the irradiation to treat the sewage. The core competitiveness of CORAY-Solution is the combination of irradiation tech and conventional tech in

which the minimum quantity of irradiation is used to solve the problem so as to reduce the cost to the range the clients can bear. Except some research projects, we haven't yet found that the products of this company are applied in the market.

An American Corporation can take advantage of ultraviolet to decompose or convert the pollutants. However, the capacity of their product is very limited with a very high cost, which is also an unavoidable problem cannot be settled by only using irradiation tech. The key problem is that the radiation energy generated by  $\gamma$ -ray and electronic beams are far more than ultraviolet which means stronger capacity and higher efficiency in decomposing. Therefore, the CORAY-Solution is more competitive.

#### 3.4.2 Technology developer

Research institute of Nuclear physics of Tsinghua University featuring in science and engineering, Tsinghua University is the best university in China under which Nuclear Institute earns the high reputation in the world and is called as "The cradle of nuclear physics technology of China". Tsinghua University has its own nuclear reactor system which is unique among all of universities in China. The pebble-bed High Temperature Gas-cooled Reactor (HTGR) developed and built by Nuclear Institute realized Grid Generation with full power in 2003. China ranks among the few countries who master this tech due to the great achievement. Nuclear Institute is dedicating to the development of civilian nuclear technology and spread the application of nuclear tech to extensive fields such as container inspecting, industrial instrument, ceramics and so on. Nuclear Institute can provide a complete set of facilities for trial, which is very beneficial to R&D and trial of CORAY.

#### 3.4.3 Main equipment suppliers(Back-up)

Si'chuan Jiuhuan Electronics Co., Ltd. is a subsidiary company of China Academy of Engineering Physics, which is engaged in the R&D and production of electronic physics equipments such as electronic accelerator, high voltage pulse power supply and etc. The company used to take responsibility on variety of national scientific and research projects such like "The ninth five-year plan", "The Tenth five-year plan", "863 Project" and etc. Their electronic accelerators for irradiation is featuring the high-efficiency, big power and wide energy range. Moreover, the company cooperates with the ViVirad of France and Toriy of Russia in the mode of integration of scientific research with production to improve the technology as well as enlarge the application of the electronic accelerator. Their products can be applied in the fields of film radiation, Cross-linked cables, Heat Shrinkable products, pre-sulfuration of the tyre by radiation, disinfection and sterilization by radiation and etc. the company provides the clients with customized equipments but also technical services including consultation for the

construction of the radiation facilities.

#### 3.4.4 Owner of Demonstration Project

We are now negotiating with China Petroleum Jilin Petrochemical Co., Ltd. located in northeast of China and preparing to adopt CORAY-Solution to set up the first waste water treatment system. Jilin Petrochemical Co., Ltd., the biggest chemical corporation of Petro China, has the biggest capacity for acrylonitrile production in the world with an annual output over half of the total yield of China.

They are at present using incinerators to deal with the waste water emitted by acrylonitrile facilities, but due to the high cost they have to look for a better solution to the problem. They are very interested in CORAY-Solution and now the project has entered into the experiment stage.

#### 4 How

##### 4.1 Executive Plan

The present project owner Coway will sign Exclusive Licensing Agreement with CORAY after the investment agreement is signed and CORAY is established.

The executant will recruit a team for sales and service for CORAY. The team should comprise of at least four persons including one sales manager, one sales engineer and one technical engineer. The team should be enlarged along with the increase of the orders. In addition, an experienced engineering designer is needed by technical develop department, and financial and administrative personnel should also be recruited. For CORAY-Solution is completely new plan, we need to process a sample project to verify the feasibility as well the reliability of it. Jilin Petrochemical Co., Ltd. has agreed to use a sample facility to treat the waste water of acrylonitrile. Now the experiment is processing and CORAY will implement the construction in the next stage.

The **executive plan** is as follows :

Activity	Schedule	Cost (Euro)
<b>Planning tasks</b>		
- <b>Permits</b>	Year 0, month 9	5,000
- <b>License Agreement</b>	Year 0, month 9	300,000
- <b>Recruiting</b>	Year 0, months 9-12	10,000
- <b>Rent Office (1<sup>st</sup> year)</b>	Year 0, month 8	50,000
- <b>Open for Business</b>	Year 1, month 1	
<b>Demonstration Plant</b>		
- <b>Demonstration Contract</b>	Year 0, month 9	
- <b>Designing of Process</b>	Year 0, months 1-6	
- <b>Engineering Design</b>	Year 0, months 7-9	
- <b>Purchasing &amp; Installation</b>	Year 0, months 10-12	
- <b>Training</b>	Year 1, month 1	
- <b>Start-Up &amp; Test run</b>	Year 1, months 2-6	
- <b>Optimization</b>	Year 1, months 7-9	
- <b>Delivery</b>	Year 1, months 10	



### Team Building Plan

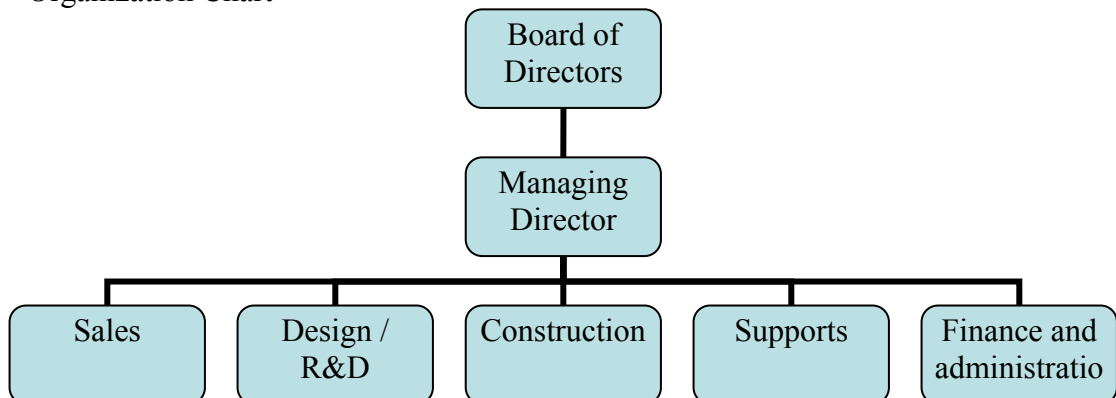
	Year 1	Year 2	Year 3	Year 4	Year 5
Technical Developer					
- R&D	2	2	3	3	4
- Engineering designer	1	2	2	3	3
- Technical engineer	1	2	3	3	4
- Sales engineer	2	3	4	5	6
Administrator	1	1	2	2	3
Admin.	1	1	2	2	3
Total	8	11	16	18	23

### Sale target

Hereon we suppose that engineering design and technology license rather than any kind of equipment are only provided in all the contracts and the average income per contract is Euro 300 thousand.

	Year 1	Year 2	Year 3	Year 4	Year 5
Contracts (unit)	1	2	4	6	8
Income	3 M	6 M	12 M	18 M	24 M

### 4.2 Organization Chart



## 5 Environmental and social impacts

### 5.1 Environmental impacts

As a new environment protection technology, CORAY-Solution benefits the environment in three aspects as below:

The high expense of treatment may result in illegal emission by the polluters risking danger in desperation. CORAY-Solution can provide a cost-acceptable plan for the de-biodegradable pollutants so as to reduce the illegal emission. Compared with the incinerators, this solution can save a great deal of fossil fuel. Since the world is facing more and more serious energy deficiency, to save the fuel doesn't only mean a reduction of cost but also a sustainable development of our human beings.

Besides, incinerators cause the GHG emission. Expect the off-gas, other toxic gases like NO<sub>x</sub>, SO<sub>2</sub> will give rise during the incineration. CORAY-Solution avoids these problems. As an organization which provides engineering and technical services, CORAY only need offices rather than land expropriation and construction, which won't bring any adverse impact to the surrounding environment.

### 5.2 Health

People may worry about the potential threats to health brought by nuclear radiation. The point to be emphasized is that the radiation equipment applied in CORAY-Solution is very safe and reliable. Those electronic accelerators have been widely employed in the food packaging, pharmaceutical, tyre production and other industries. It has been commonly certified that the equipment won't bring any hazards to humans at all as long as they are installed and operated according to the technical standard.

## 6 Basic Case

### 6.1 Basic Assumptions

We make a forecast for the possible turnover of CORAY (See 4.1) and regard the forecast as a basic assumption of Base Case. For the operation cost, we refer to other companies established in China with similar business and scale and get the results as below:

No.	Item	Programming by year ( thousand EUROS )					
		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<b>1</b>	Share capital	1,100					
<b>2</b>	Number of contracts		1	2	4	6	8
<b>3</b>	Revenue		300	600	1,200	1,800	2,400
<b>4</b>	Operating cost		236	287	374	448	376
<b>5</b>	EBITDA		81	314	800	1,294	1,953
<b>6</b>	Tax		12	70	190	313	473
<b>7</b>	Depreciation		33	34	40	41	61
<b>8</b>	Net income		36	210	570	940	1,419
<b>9</b>	Add-back depreciation		69	244	610	981	1,480
<b>10</b>	IRR				26%		

Cash Flow

No.	Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
1	Cash income	1,100	300	600	1,200	1,800	2,400
2	Payroll		-118	-159	-235	-294	-378
3	Tax		-28	-103	-256	-412	-561
4	Other expenses	-15	-85	-95	-105	-120	-135
5	<b>Net operating cash flow</b>		<b>69</b>	<b>243</b>	<b>604</b>	<b>974</b>	<b>1,326</b>
6	Fixed assets expenditure		-16	-5	-8	-5	-12
7	License Fee	-300					
8	<b>Net cash flow</b>	<b>785</b>	<b>53</b>	<b>238</b>	<b>596</b>	<b>969</b>	<b>1,314</b>

Cash Flow (no contract within first 3 years)

No.	Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
1	Cash income	1,100	0	0	0	300	600
2	Payroll		-118	-118	-118	-118	-159
3	Tax		-28	-28	-28	-28	-103
4	Other expenses	-15	-85	-85	-85	-85	-95
5	<b>Net operating cash flow</b>		<b>-231</b>	<b>-231</b>	<b>-231</b>	<b>69</b>	<b>243</b>
6	Fixed assets expenditure		-16				-5
7	License Fee	-300					
8	<b>Net cash flow</b>	<b>785</b>	<b>-247</b>	<b>-231</b>	<b>-231</b>	<b>69</b>	<b>238</b>

The sale volume is obviously the most sensitive thing. Especially at the beginning of the company, contract quantity plays important role in the achievement even if one contract is increased or decreased. However, along with the growth of contract with years, the sensibility will reduce accordingly. The cash flow table shows that CORAY can collect adequate capital without too much money in a short time to back up the operation of company. However, considering the sensitivity, the collected capital should assure three-year running of the company even if there's no income at all so as to avoid a cash flow crisis under the condition that the contracts are less than expected at the early stage of the establishment.

## 6.2 Feasibility

We've made the worst of the unexpected factors. The worst may be that the market doesn't recognize the new technology, which brings obstacles to sales. The planned investment covers three years' operation and we conclude that three years is long enough to open the market.

## 6.3 Financing plan

The total financing amount is Euro1.1 million among which half of it is from the project owner COWAY and the other half is from the investor. Either of them will hold 50% shares individually. After the financing, Euro0.3 million will be used to buy the exclusive license.

## 7 Risk

Risk: Market acceptance

How to handle:

Since new technologies are adopted in CORAY-Solution, the clients may be suspicious on it for they don't know much about the new thing and this attitude will influence the sales and then move to the financial status of the company. Therefore, it is very important to set up a sample project to verify the reliability of the technology to the public. At the early stage of the market entry, it is also necessary to take part in some activities for technical communication as well as various propagandas. In terms of it, budget for AD. will be made annually for market promotion.

Risk: Unreachable sales target

How to handle:

Considering the market-entry risk of CORAY-Solution, we make a conservative assessment on the sales in the financial forecast. In the first year, the sample project successfully delivered to Jilin Petrochemical Co., Ltd. will be regard as the first income of CORAY, which helps to realize the sales target of this year.

Risk: Failure of the sample project

How to handle:

Provided the sample project failed, CORAY would get into a financial crisis and the negative reputation will bring a deathblow to the company. To avoid a failure due to technical factors, we've processed cautious experiments certifying the technical plan is feasible.

Risk: The quality of the key equipment

How to handle:

The equipments of CORAY are purchased from the professional manufacturers. Since the deficiency of the equipments will influence the effect of CORAY-Solution, a strict assessment system on the equipment suppliers will be helpful to avoid any quality problem. In addition, reasonable guarantee from the suppliers should be included in the purchasing contract.

Risk: Less experienced sales and service team

How to handle:

It is non-avoidable for the new established team to undergo a adaptation since the new product is strange to every member of the team. Therefore we'll make training courses for the fixed personnel other than reviewing their knowledge background and working experiences. For the team leader, we will also review leading capacity, past achievements as well as reputation additionally.

Risk: Technical team lacking engineering experiences

How to handle:

Although the present technicians are good at the research in the lab, they are lack of adequate engineering implement experiences which may result in a defect of the

designed solution. To avoid it, engineers with rich engineering design skills and experiences to supplement the technical team.



## Sample Proposal S

<b>Date:</b>	August, 2008
<b>Investment Name:</b>	AFEA FEERE
<b>Country/Region</b>	Senegal/West Africa
<b>Technology:</b>	Solar PV
<b>Investment Amount:</b>	€40,833 (US\$63,333);
<b>Investment Type and Terms:</b>	Five-year loan remunerated at 10.5% annually; 06 months grace period on principal only
<b>Rationale for Interest Rate:</b>	Interest rate fixed 2% above the weighted lending rate of the past six months, which is 8.5%. This is to compensate for the longer term and the lack of collaterals.
<b>Collateral, include dollar value:</b>	Company's assets ~US\$49,048 (Inventory of Solar PV mills). State the percentage contribution of the entrepreneur to this transaction.

### Investment Summary:

- 1) Established since 1996, AFEA FEERE<sup>12</sup> is a non-profit organization whose mission is to foster women literacy and empowerment in rural areas in the region of Kolda, South of Senegal. In November 2007, following several successful and innovative programs and projects; AFEA registered a for-profit subsidiary, Dental<sup>13</sup> Paroumba, to further through income generating activities, the social integration of individuals it had provided with basic literacy.
- 2) This investment opportunity is concerned with the first phase of a program to roll out solar mills in 20 villages in the district of Paroumba to relieve about 6,299 women from the never-ending drudgery of pounding grain into flour. The roll out of solar is the first project or activity undertaken by the subsidiary Dental.
- 3) The majority of food consumed in rural villages is cereal-based and often needs to be processed before it can become edible. Lack of equipment means that much of the food processing has to be done manually. Consequently, a great majority of rural Senegalese women still wake up early around 4 am to pound or grind grain into flour both in preparing foods as well as for markets. Grinding grain into flour is an energy intensive activity, where women spend considerable time and labor that involves exhaustive physical exercise. It takes half an hour to grind a kilogram of flour by hand, but only about one minute when using a motor-driven mill. This energy and time consuming activity takes up a large chunk of rural women's time and often prevents girls from pursuing their education.
- 4) The business model for this investment program is based on establishing small-scale rural milling enterprises, built on well-trained managerial and operational staff, functioning profitably to service the loan, maintain service provision, and generate surplus for the women. The management of the solar mill in each village

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<sup>12</sup> AFEA is a French acronym for "association for adults and youth training"; while FEERE is a Poular word to describe the most efficient way or process.

<sup>13</sup> Dental is the Poular word for understanding.

- will be entrusted to the local women association (trained by AFEA), through a leasing agreement with Dental. About 9.6%(US\$ amount) of the financial revenues obtained from the service offered will be redistributed to women managers of the mill in the form of weekly salaries, 13%(US\$ amount) will be used to cover Dental's overhead, a portion representing 37.9% (US\$284 per month over 60 months) will be retained for loan servicing, and the surplus or profit (~US\$296.5), will be shared between Dental and each women association on 50/50 basis.
- 5) The share to women association will be placed in savings and credit funds to enable women to intervene in the development of the villages. Ownership of the mill will be transferred to each women association once financial obligations towards Dental are fully met.
  - 6) A central component of the business model entails assessing existing managerial resources and choosing the best available, and also creating the needed capacities. Twenty villages are targeted by Dental in three phases. The first phase will represent five villages, 50 women will be trained (ten per village); and from these, three will be selected per village to manage the mill. The training will include very basic accounting, functional reading and writing in their local language, and filling out the management and monitoring tools.
  - 7) The roll out in the 20 targeted villages was broken down into three phases:
    - a. The pilot and first phase will target five villages. The total investment cost for this phase amounts to about US\$63,333. This phase is expected to serve as learning experience both for Dental and women associations. It will help develop a database related to methodological, technical, financial, and social on the mill performance in order to facilitate replicability of the business model and efficient monitoring. This investment proposal is concerned with this phase.
    - b. Though, the supplier of the solar grinding mill, Motagrisol, has generic data on the technical and operational characteristics of the mill; the actual operation somehow differs according to different social settings.
    - c. Phase two is expected to begin twelve months after phase1. Following an evaluation of phase1, phase2 will target seven villages and is expected to cost about US\$88,666. Phase2 is expected to refine and standardize management and control procedures; thus providing a framework to Dental to manage a larger number of (leased) mills.
    - d. Phase three is expected to cost about US\$101,332 and will target eight villages. Requests for financing of phase2 and 3 will be submitted to E+Co as the program evolves.
  - 8) Dental is requesting funding of €40,833 (US\$63,333) E+Co for the implementation of the pilot phase that will target approximately 2,346 women in the villages of Kambasse, Kaolack Saicou, Mamato Peul, Pakour, and Samba Coupda. The financing is expected to be in the form of a five-year loan remunerated at 10.5% with quarterly repayment and six months grace period on principal only.
  - 9) The salient risks features of this investment proposal include the following:  
Market Risk:

Mitigation:

- a) Sustainability risk: this refers to the capacity of each milling station to survive. In other words, will the mills be able to generate sufficient revenues to cover their expenses –salaries, debt servicing, and maintenance. A steady stream of clients and a resulting steady source of revenues are a prerequisite for the sustainability of milling operations. A steady flow of revenues can also be influenced by seasonal variations in the number of clients, technical and human resources challenges, etc. (Why should sustainability be a risk if there is need and demand for this service? Is this a top down/technology push or it is demand driven/bottom up project???)

Mitigation: each village is actually a cluster of several smaller villages; and as such adds up to an important potential volume of clients. The villages were carefully selected due to their demographics, and geographical dispersion to ensure sufficient volume and avoid competition.

- b) Structural or management risk: this is the risk related to the capacity of Dental of effectively managing this program
- c) Human capacity risk: the viability and sustainability of milling operations greatly rely on the availability of adequately trained women. The training is made more difficult as there are different starting points and different learning curves given the prevalent illiteracy. There is also the potential of loss of trained women to other occupations or jobs. Mitigation: AFEA experience with women literacy campaigns in the targeted communities is a solid foundation from which to design and implement tailored training programs. Motagrisol also has a wealth of experience in setting up milling operations in rural communities. This project is going to be implemented by women have already undergone literacy training/programmes by Dental, right?? Does Motagrisol have any experience of these income generating mills managed by women or being managed by Motagrisol?
- d) Organizational risk: this refers to the capacity of women associations to establish and implement clear guidelines for the responsibilities of all involved. In addition, while the management committee (miller, cashier, treasurer, and controller) of a given women association may be representative of the association at large, this does not guarantee members that act for the benefit of the association at large. At times, committee members could be too busy with other responsibilities and not available to play their role. Mitigation: a consultative committee including Dental team and representatives of women associations will supervise the activities and performance in each village. This committee will reiterate established rules and enforce as necessary including renewing non performing management teams to ensure that those who are not able to be fully engaged are replaced. Is there ample human talent and resource to effectively change management team at short notice? Given that the best three will be chosen for the first phase of the project, how can we guarantee that the second best will be good enough to do the job?
- e) Ability to Pay and willingness to pay for this service

- f) Technical risk: this refers to the capacity of Dental to address technical issues related to system repair and maintenance in a timely manner. Mitigation: the solar grinding mills produced by Motagrisol have an impressive track record of reliability. There are existing systems that have been running for over five years without any complaints or break down. Basic maintenance training will be provided to three technicians residing in the village. Procedures for reporting system failures, repair requirements will be established. Does Motagrisol have a field team(extension officers sort of??)
- g) Foreign exchange risk: this is the risk related to the depreciation of the FCFA as a result of an increase depreciation of the US\$ against the Euro. Mitigation: the loan will be in Euro (€).How practical is this given the location and sophistication of the businesses both Dental and the mill organisation

### **Rationale for Support:**

Working with women groups in the targeted villages on implementing the solar mill business model, Dental will seek to promote a sustainable approach to reducing rural poverty. Rural women who are the intended beneficiaries of the mill will experience a significant reduction in the burden associated with typical household tasks as well as savings in the time devoted to these activities, which will allow them to engage in income generating opportunities and improve their overall socio-economic position.

In addition to these direct impacts on women, the solar mills will lead to improvements in school attendance by girls, social integration, and mobilization of the potential productivity of women, all of which contribute to reducing poverty in rural areas. The introduction of the mills will make radical short and long-term changes possible. It will give women access and ownership to technology while maintaining their social role and responsibility for the food security and nutritional well being of their families. Access to milling services frees up both time and energy, reducing daily time spent on chores by 2 to 3 hours on average.

It is estimated that for the first phase of this program, potentially 1,082,880 hours of hand grinding could be saved by 2,346 in 564 households. These hours could be used for resting, enhancing the quality of family welfare, educating children, generating additional income, and obtaining training.

The successful implementation and sustainability of this investment program requires an in depth knowledge of the local social structure and customs. The management team has a profound experience and impressive track record of successfully implementing development initiatives in the targeted and working with the women associations that it helped setting up. The rationale for support is inconsistent with the sustainability risk presented above?

### **Strategic Importance:**

If successful, this investment presents the potential of replication in other villages and therefore additional investment opportunities With significant social return.

### **Additional Business Information and Marketing**

Registered in 2003 as a non profit association, AFEA FEERE is a direct offshoot of the Gie FEERE that was set up in 1996 to foster women literacy and empowerment in rural areas in the region of Kolda, South of Senegal. Initially operating as a “Groupement d’Interet Economique” (GIE) –literally a “grouping of mutual economic interest”- which is the simplest form of corporation in Senegal; the legal form of the organization was changed to facilitate the flow of funding as funders were becoming increasingly reluctant in funding a for-profit entity to undertake community development work. Between 1998 and 2003, the Gie FEERE received total funding(grants) amounting to FCFA109,500,000 or about US\$220,000 to run four sub-programs under the women literacy project (PAPF) sponsored by the Government of Senegal and the World Bank. These sub-programs have made possible it to enroll 2,437 women learners in twenty villages in the rural community of Paroumba, which has led to reducing the level of illiteracy among women from 88.9% to 56.1% and decreasing gender disparities. The dynamism exhibited by women during the experience/implementation has provided the platform for the Gie FEERE to help these women to pool their resources, to address the multifarious structural problems they have to face through greater social mobilization within associative interest groups. Twenty formal women associations were set up, one per village, with inscription into the register of trade to promote social development and income generating activities. The Gie Dental Paroumba, a for-profit entity, was set up in 2007 by AFEA to foster income generating activities by these women associations and other individuals from the different literacy programs.

The most urgent problem confronting women in the targeted communities is physical exhaustion. The cause of women’s exhaustion is structural. Women are responsible for the daily food security and nutritional well being of their families. This requires food production and processing and/or earning income to purchase food. In addition, women have a range of family maintenance and reproductive tasks, including fuelwood collection, water procurement, sanitation, child bearing, child care, and food preparation. These tasks are energy intensive, although precise data on energy expenditure organized by the nature of activities are lacking.

There are no mills available in or nearby the targeted villages. Women ground cereals at home using mortars. To reduce time allocated to domestic activities and their burden and creates opportunities for income generation; women groups have repeatedly over the years requested AFEA’s assistance in accessing mills.

The prohibitive cost of the available milling technologies –diesel and solar -- constitutes a major obstacle for these women to aspire to mills as their income generating and time saving project. The price of a diesel powered mill is around US\$5,000 and about US\$9,000 for a solar mill. Traditional mechanisms of credits (tontines) do not permit, due to the weakness of the amounts they can offer, to meet the needs of funding individual or

collective activities of women, and to impulse a real development of women entrepreneurship. In an effort tackle these challenges and lessen the drudgery of rural women, AFEA, through its subsidiary Dental, is launching a program to roll out solar mills in each of the twenty villages by drawing on its successful interaction with these communities.

Typical community milling enterprise will provide milling services using a solar mill supplied by Motagrisol, a Senegalese engineering company. An alternative technology, the solar mill presents the following key attributes to influence market acceptance:

- a) **No fuel requirements**. It does away with the often expensive and erratic supply of fuels. A diesel mill in a village consumes on average 4,500 liters of fuel per year. A solar mill has no fuel requirements. Individual PV modules of a solar array can be readjusted in size to meet individual or group demands. The table below provides an indication of fuel consumption by a diesel mill.

<b>Sample diesel fuel use by a grain mill in rural areas</b>		
<i>Settlement</i>	<i>Energy use liter per year</i>	<i>Energy intensity liter per 100kg</i>
<i>Rural town</i>	<i>5,700</i>	<i>2.0</i>
<i>Rural village</i>	<i>4,500</i>	<i>1.7</i>

*Source: UNDP, 2002*

- b) **It is highly reliable** as compared to a diesel-powered mill; operation and maintenance are very low, simple and easy. PV modules have to be cleaned periodically; and the batteries can last between five and seven years.

**Comparison of diesel and solar costs (\$) for 100kg/day or 30 tons per year of grain milled**

<i>Costs items in US\$</i>	<i>Diesel</i>	<i>Solar</i>
<i>Initial investment</i>	<i>3,673</i>	<i>7,000</i>
<i>Annual fuel costs</i>	<i>4,950</i>	<i>0</i>
<i>Operation &amp; maintenance costs</i>	<i>290</i>	<i>35</i>

*The diesel mill here only has the milling option; while the multifunctional platform with a much powerful engine, and additional modules (oil press, huller, and generator) costs about \$13,580.*

*Fuel price = US\$ 1.10 per liter. The annual savings on the fuel and maintenance cost pay back for the mill within two years.*

Creation of a **new service** or **income generation activity**—the milling of cereals. The direct beneficiaries of this activity are women and girls who are traditionally responsible for milling by the use of a pestle and mortar, or the grinding stone. The time saved thanks to the use of the solar mill is one of the most patent benefits; the aggregate time saved per woman over a week in the processing of cereals (millet, sorghum and maize) amounts to eight hour. The time saved can be interpreted in two ways: less time per task and/or less arduous tasks enabling other activities to be done.

The value of the solar mill as a viable alternative to the conventional diesel powered mills lies within the nature of the technology as it is unlikely, in the short run, to have a cheaper product using the sun as source of energy. There is no cheaper solar alternative currently available to provide milling services to remote and non-electrified areas. Dental's offering is the right competitive product due to its low operating and maintenance costs; and therefore its ability to provide a cheaper milling service to the end-users. Practically the solar mills will not replace diesel mills right?

Instead of looking for individuals and entities within the targeted villages that can afford to pay for the solar mill, the strategic thrust is to increase affordability of the mill by leasing the mills to small-scale rural milling enterprises, built on well-trained managerial and operational staff, functioning profitably to service the loan, maintain service provision, and generate surplus for the women. Management of the solar mill in each village will be entrusted to the local women association, through a leasing agreement with Dental; each women association will have full ownership of the mill once their financial obligations are fully met. It will be the responsibility of each women association to ensure that a percentage of the financial revenues obtained from the milling services will be redistributed to women operators/managers of the mill in the form of weekly salaries, a portion will be retained for loan servicing and to pay for Dental's overheads, and the surplus or profit equally shared with Dental. The share of the surplus of women associations will be placed in savings and credit funds to enable women to intervene in the development of the villages. What if the leased mills don't generate enough income? What happens to the mills and Dental?

The designation of each village for the establishment of the milling enterprise occurred through a participatory pre-feasibility and feasibility assessment by Dental. This assessment was undertaken in two phases. First, a relatively short assessment was undertaken to determine whether the basic conditions (demographics, social organization) for a milling business were present. Once the first assessment confirmed the potential for a self-sustaining milling business in the village, a full participatory assessment was conducted to confirm social and economic viability. This assessment covered mainly two issues: economic profile of the community, and women's economic and social organization. This enabled Dental to make informed choices, and clearly identify the scope of capacity building required. This paragraph is optimistic and should be used as mitigation for the sustainability risk stated above

The mills will be installed in small buildings, built or provided by the communities, at a central location in each village, typically adjunct to an existing primary business, such as a tuck shop. It is Dental's belief that community mills can and should be economically viable entities. This principle reflects the evolving economic conditions in the development field, which increasingly support the finding that the provision of energy services in rural and low income areas can be self-sustaining, as well as reinforcing broader development and economic objectives. Each milling enterprise will be expected to generate enough income from its day-to-day operations to fund its operating costs, provide a reasonable enough salary for the millers, and also service the loan. The bulk of

the revenue will come from direct customer payments for the service. Prices of the service will be set to ensure the financial sustainability of the milling enterprise as well as maximum affordability for local end-users. This means that milling services will be priced in direct relation to the charges paid by women associations to Dental, plus some mark-up to cover labor and overhead costs. Prices for milling will be FCFA35 (US\$0.083) per unit, the unit being a tomato tin of 01 kg or similar container.

The twenty villages targeted in the roll out plan are situated in the rural community of Paroumba, in Pakour local government area, within the administrative division of Velingara, in the region of Kolda. The villages have a total population of 12,113; with approximately 6,299 women. The socioeconomic profile of the area is characterized by an annual gross per capita income of approximately US\$370 against US\$530 at the national level. Dominant economic activities are maize, rice, cattle breeding, millet, groundnut, cotton production, and vegetable garden crops. Typical poor households with average annual revenue of US\$800-900 households derive their revenue from farming and income generating activities including gardening, poultry farming, tie-dye for clothes, shops, and animal fattening. The table below presents the demographics of the five villages involved in the first phase of the investment program.

Demographics of the first phase

<i>Village</i>	<i>Population</i>	<i>Satellite villages</i>		<i>Total targeted Population</i>
		<i>Number</i>	<i>Population</i>	
<i>Kambasse</i>	255	05	566	821
<i>Kaolack Saicou</i>	177	3	305	482
<i>Mamato Peul</i>	489	5	477	966
<i>Pakour</i>	1,503	2	313	1,816
<i>Samba Coupda</i>	110	2	318	428
<b>Total</b>	<b>2,534</b>	<b>17</b>	<b>1,979</b>	<b>4,513</b>

1. *The mills will be located in the main villages but will also cater to the needs of the satellite villages. These are villages situated within an average range of two to three kilometers.*
2. *With an estimate of eight people per household, it is estimated that the first investment phase will provide service to about 564 households, and approximately 2,346 women.*

There are numerous uncertainties surrounding the factors that will influence demand, and there is very little or no practical experience with this type of technology and business model in the targeted communities. Nevertheless, postulates were made in developing a basic framework for analyzing a range of demand and revenue scenarios for each milling enterprise in the targeted villages. This foundation helped to establishing the parameters for both individual business plans as well as the broader rollout forecast.

Data from the feasibility analysis suggest that use of the milling service, as well as the amount spent will vary by season. The number of clients' visits is expected to be lower during the dry season and higher during the rainy season while potential expenditure per



visit is expected to show an opposite pattern<sup>14</sup>. The table below presents estimates of visits and expenditures per village involved in the first phase of the roll out.

<i>Village</i>	<i>Dry season</i>		<i>Rainy season</i>	
	<i>Visits</i>	<i>Expenditures(\$)</i>	<i>Visits</i>	<i>Expenditures(\$)</i>
<i>Kambasse</i>	1,231	821	1,648	588
<i>Kaolack Saicou</i>	723	482	964	344
<i>Mamato Peuhl</i>	1,449	966	1,932	690
<i>Pakour</i>	2,724	1,816	3,631	1,296
<i>Samba Coupda</i>	642	428	856	306
<b><i>Average</i></b>	<b>1,354</b>	<b>0.66</b>	<b>1,806</b>	<b>0.36</b>

It is estimated that a minimum of 90% of women will use the mill; this represents an average of 1,354 visits per month per village (3 visits per week per household) during the dry season and an average of 1,806 visits during the rainy season (4 visits per week per household). While expenditure per client visit is expected to average FCFA232 (US\$0.55) per visit, clients are expected to spend on average FCFA150 (US\$0.36) per visit during the rainy season and about FCFA280 (US\$0.66) per visit during the dry season. Milling needs are much higher during the harvest season, when women's time is scarce, and energy needs are higher.

With a better understanding of the community socio-economic environment, potential market size, milling operation and financial plans were developed based on realistic expectations and therefore more likely to result in successful business cases. The table below page provides an illustrative sample of an economic forecast for a standard milling business.

<i>Standard monthly economic features</i>	
<i>Quantity of grains processed</i>	<i>9,000 kg</i>
<i>Revenue from milling</i>	<i>\$750</i>
<i>Operator's remuneration</i>	<i>\$72</i>
<i>Overheads of Dental</i>	<i>\$97.5</i>
<i>Loan payment</i>	<i>284</i>
<b><i>Total expenses</i></b>	<b><i>453.5</i></b>
<b><i>Net income or surplus</i></b>	<b><i>296.5</i></b>

*The actual number of operating hours is flexible as needs may vary according to time of the day, and season. Overall, it is expected that the mills will operate from 8 to 11 o'clock in the morning and from 3 to 6 in the evening. The average daily income per mill is based on the assumption of 300 kg of grains processed per day at a price of FCFA35 per kg (~US\$0.083).*

<sup>14</sup> *To simplify the analysis, the financial model shows conservative estimates throughout the year.*

The mill requires for its operation and management, a new type of know how and work organization which necessitates prior strengthening of operational capacities of women. Members of women's associations will be trained in managerial and entrepreneurial skills to ensure the technical and economic viability of the mill. This is a critical component in ensuring that each milling business is led by and works for the women. The approach adopted by Dental consists in training ten women per village, designated by women associations among whom the future mill managers will be chosen (cashiers, millers, treasures, and controllers). This is to ensure flexibility in the selection of operators according to criteria of competence as well as social criteria appropriate for each village. This number will also allow a rotational system, which will enable women to reconcile the necessity of a permanent presence at the milling station with the requirements of their daily schedule. Young women who have received adult literacy training or semi schooled will constitute the core of the management system because of their instruction and the training which is indispensable for the management of the mill operations. They will assist women who do not receive the adult literacy training in the accomplishment of their functions –cashiers, treasurers.

The responsibility of key stakeholders involved in the scheme will be as follows:

1. Dental will secure financing and purchase the mills; strengthen the capacity of women associations in the provision of the service such that they will be able to survive economically. Dental have developed tools to monitor the economic performance of the milling operations in the villages. Transparent collection of data will make it possible to pinpoint both deficiencies and successes.
2. Women associations: mobilization of village labor and funding for the construction of the shelter to host the mills, operation of the mills, management of resources generated by the milling enterprise. The women's association establishes management mechanisms to ensure smooth implementation. The association elects management committee members who will oversee milling operations, schedule the work, distribute benefits arising out of the mill operation, and develop a mechanism to address any potential confrontations that may arise.
3. Motagrisol: supply and install the mills, provide training to women to operate and manage the mills, train staff members from Dental responsible for preventive maintenance, ensure maintenance.

### **Management and Sponsors**

AFEA FEERE is a non profit organization with a focus on women literacy and social development in the region of Kolda. The organization employs four full-time staff members and has been working in the area for the past eleven years. The organization has been the main implementing partners in the region of different literacy programs for the government and international donors; and therefore has a profound knowledge of the socio-economic profile of the area. The fiduciary responsibility of the scheme will be entrusted to AFEA's for-profit subsidiary, Gie Dental Paroumba. However, the human

resources and business infrastructure will remain the same. The advantage of this structure is that the intellectual capital accumulated over the years by AFEA will be directly available for the investment implementation with little incremental human resources costs.

Key staff members of AFEA include:

**Sambel Balde (45):** founder and general manager of AFEA; he will directly supervise the implementation of the roll out of the mills. Over the past eleven years, he has successfully designed and implemented 14 adult literacy and poverty alleviation programs with AFEA in the region of Kolda in partnership with institutions such as the Government of Senegal, the World Bank, World Visions...etc He holds a bachelor in education with specialization in informal learning/education. He is the author of several textbooks and manuals for adult literacy used at the national level. Before setting up AFEA, he worked for two NGOs including Aide & Action (4 years) and SYSED (2 years) as coordinator of several adult literacy programs. Mr. Balde is currently completing a Master in social practices with the University of Paris II (Sorbonne Nouvelle) through a long distance learning program. He successfully completed all the courses in December 2007, and the presentation of his dissertation is scheduled for July this year.

**Maounde Kande (46):** Program manager; has been involved with AFEA since 2003. Prior to that he worked as program officer and supervisor for fourteen years with renowned organizations such as Humana, and Aide & Action. Mr. Kande holds a National Diploma in rural planning and development. In 1995, he successfully completed a one-year course in accounting for small businesses. Within the framework of the CAEF program, he completed a four-month training program in 1999 on women entrepreneurship. Mr. Kande will monitor the financial performance of the mills, and perform revenue collection from the milling enterprises on a weekly basis.

### Implementation Strategy

- 1) The existing women associations established in each village since 2003 will be the cornerstone of this program. The women associations will provide the social collateral to ensure that the leasing obligations are met by each village. Each women association will sign a formal leasing agreement with Dental Paroumba. The associations will sensitize their respective members, mobilize the village labor and funding for the construction of the shelter to host the mills, operate the mills, and manage the resources generated by the mills.
- 2) Based on pre-agreed criteria with Dental, each association will appoint a management committee of five members.
- 3) Dental will provide training to the members of the management committees to ensure that they are equipped to properly manage the milling operations.

- 4) Once a week, a program supervisor from Dental will visit each milling enterprise to monitor activities and performance, and address potential problems.
- 5) Sales revenues from milling operations will be deposited in accounts opened with micro-credit institutions. At the end of each week, reconciliation of each account will be made by Dental and proceeds shared as stipulated in the agreement with women associations.
- 6) Motagrisol will provide technical training, and maintenance.

### **Financial Controls**

Financial procedures in place are simple and mostly focus on recording expenses in order to report to funders or donors. The organization does not employ a qualified accountant, and does not generate financial statements. Recommendation was made by E+Co that the organization hires the service of an accountant on a part-time basis, working at least two days per week.

### **Technology**

The solar panels are connected to a bank of batteries using a solar charge controller. The motor of the mill is then connected bank of batteries by means of a switch that that is used to turn the motor on and off. Power is delivered to the motor and used for grinding when the switch is turned on. The quality and reliability of the mill is the result of twelve years of technical development and more than five years of field testing in three villages. The rural motorization for cooling, freezing, ventilation, milling, peeling etc requires a rugged, simple and locally sustainable design. This means no power electronics. These criteria led to the choice of a dust-proof brush motor design. The engine –the M 1,500 Motor- is supplied with standard 18-teeth pulley which can be easily dismantled for bearing replacement; the mill hammers and the pump impeller can be directly adapted to this pulley; this reduces stockholding and tooling problems. An opening in the brush area allows for collector cleaning in motion with an abrasive rubber stick. The main characteristics/data of the system can be summarized as follows:

*Main Data*

<i>Nominal voltage</i>	<i>24 V @ 4,500 rpm</i>
<i>Full load current</i>	<i>80 A 3.33 Nm</i>
<i>Δ T on frame at full power</i>	<i>60° C</i>
<i>Approx, efficiency at full power</i>	<i>78%</i>
<i>Ventilation</i>	<i>Rear shaft fan</i>
<i>Mounting</i>	<i>Flange or foot</i>
<i>Weight (with pulley)</i>	<i>17.5kg</i>
<i>Max current</i>	<i>100 A</i>
<i>Max voltage</i>	<i>60 V</i>

<i>PV modules</i>	<i>120Wp</i>
<i>Charge controller</i>	<i>6.0 -6.6</i>
<i>Batteries</i>	<i>24 V</i>

The solar mill is operated by one woman or miller. The starting of the engine requires no physical exercise. The mill has an average capacity of 160 kg per day. When used properly, the engine has an estimated lifespan of 15 years.

## **Finance**

### **Finance required**

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### **Financial Summary:**

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## **Investment Terms**

<b><u>Loans Terms</u></b>	
<b>Currency</b>	<b>Euro (€)</b>
<b>Loan Amount</b>	<b>€40,833 (US\$63,333)</b>
<b>Loan amount to be disbursed</b>	<b>€40,833 minus legal fee</b>
<b>Annual Interest Rate</b>	<b>10.5% per annum</b>
<b>Interest rate per installment</b>	<b>2.625%</b>
<b>Penalty interest rate</b>	<b>5%</b>
<b>Payment frequency</b>	<b>Quarterly</b>
<b>Installment</b>	<b>~US\$4,899</b>
<b>Grace period</b>	<b>Six months on principal only</b>
<b>#principal payments</b>	<b>16</b>
<b>Guarantees/collateral</b>	<b>-Personal suretyship of shareholders -Company's assets -</b>
<b>Date commitment expires</b>	<b>October28, 2008</b>

## **Risks and Mitigation**

**Sustainability risk:** this refers to the capacity of each milling station to survive. In other words, will the mills be able to generate sufficient revenues to cover their expenses – salaries, debt servicing, and maintenance. A steady stream of clients and a resulting steady source of revenues are a prerequisite for the sustainability of milling operations. a steady flow of revenues can also be influenced by seasonal variations in the number of

clients, technical and human resources challenges, etc. Mitigation: each village is actually a cluster of several smaller villages; and as such adds up to an important potential volume of clients. The villages were carefully selected due to their demographics, and geographical dispersion to ensure sufficient volume and avoid competition.

Human capacity risk: the viability and sustainability of milling operations greatly rely on the availability of adequately trained women. The training is made more difficult as there are different starting points and different learning curves given the prevalent illiteracy. There is also the potential of loss of trained women to other occupations or jobs.

Mitigation: AFEA experience with women literacy campaigns in the targeted communities is a solid foundation from which to design and implement tailored training programs. Motagrisol also has a wealth of experience in setting up milling operations in rural communities.

Organizational risk: this refers to the capacity of women associations to establish and implement clear guidelines for the responsibilities of all involved. In addition, while the management committee (miller, cashier, treasurer, and controller) of a given women association may be representative of the association at large, this does not guarantee members that act for the benefit of the association at large. At time, committee members could be too busy with other responsibilities and not available to play their role.

Mitigation: a consultative committee including AFEA team and representatives of women associations will supervise the activities and performance in each village. This committee will reiterate established rules and enforce as necessary including renewing non performing management teams to ensure that those who are not able to be fully engaged are replaced.

Technical risk: this refers to the capacity of AFEA to address technical issues related to system repair and maintenance in a timely manner. Mitigation: the solar grinding mills produced by Motagrisol have an impressive track record of reliability. There are existing systems that have been running for over five years without any complaints or break down. Basic maintenance training will be provided to three technicians residing in the village. Procedures for reporting system failures, repair requirements will be established.

Foreign exchange risk: this is the risk related to the depreciation of the FCFA as a result of an increase depreciation of the US\$ against the Euro. Mitigation: the loan will be in Euro (€).

## **Impacts**

### **Social Impact**

- Rural women are tired, overworked, and undernourished. What would women do with the time and energy saved if they reduced the time and effort dedicated to pounding grains? Most women would spend more time enhancing their family

welfare; engage in income generating activities; spend more time with the children and rest. These are all activities which women in rural areas do not have sufficient time for. An increase in available time may indirectly contribute to a rise in productivity in the fields as well.

- It is estimated that Phase1 of the roll out will make 1,082,880 of working hours available to women over five years.
- Rural women are economically and socially deprived. The first phase of the project will see the creation of 15 part-time jobs created by Women associations; this number is expected to grow to 60 by the third phase of the investment program.
- 02 part-time jobs will be created within Dental –bookkeeper and maintenance officer.
- Increased in education levels –schooling of young girls who are released from time-intensive activities, training and literacy classes for women.

#### Environmental Impact

The dissemination of the solar mill provides national economic benefits as it reduces reliance on costly imported fossil fuels. The mill is carbon dioxide free therefore displaces the emissions of harmful gases by generated by diesel powered mills. The waste from the grinding process is minimal. Used batteries are often sold to craftsmen who melt the metal and reuse it. The government also plans to establish a recycling program.

