

**GUIDE TO PREPARATION OF BUSINESS PLAN FOR
PROJECT FINANCE OF ENERGY PROJECTS**

Confidentiality: *The contents of this document and any other documents and information flows identified or described within this document are to be treated as **strictly confidential** and may not be distributed or disseminated beyond the experts from the Industrial, Legal, Financial and EC organisations named within this document. For any documents and information where wider dissemination is acceptable, said distribution shall be agreed with all parties involved and shall be clearly stated in the item concerned before the item may be disseminated beyond the realms of this project.*

Copyright: *This document remains the property of RFi and is provided on the understanding that the document shall not be changed or modified in any way without the express written permission of a RFi Director and the copyright shall not pass to any party. Where applicable, RFi acknowledge that a prior copyright exists in some of the content.*

GLOSSARY¹

Amortization

Two usages: (1) relates to the retirement of debt on an instalment or serial payment basis; (2) applies to the systematic process of charging (writing off) the cost of an intangible asset (e.g. Goodwill, systems development, copyright) over its expected useful life.

Asset

Any physical object (tangible) or right (intangible) having monetary value and owned.

Available Cash Flow (“ACF”)

Gross revenues from the sales + any liquidated damages payable + insurance proceeds received

less

Agreed operating expenses + Corporation taxes.

Balance Sheet

A financial statement which shows the financial position, condition or status of a company at a particular point in time.

Bioenergy

Energy derived from biological (plants and animal) produce, including, but not limited to, energy from direct combustion of organic matter and energy derived from organic matter in form of gaseous, liquid or solid fuel.

Book Value

The net amount of an asset or group of assets as shown in the asset account after adjustment

Capital Expenditure

An expenditure which is intended to create an asset that is expected to produce a stream of benefits (positive cashflows after a period of time) over a number of years.

Capital Structure

Refers to the different categories of long term financing employed by the enterprise, and is represented by long term debt, paid in capital (including capital surplus), retained earnings and unappropriated reserves, including revaluation surplus. Capital structure is an important indication of the ability of an enterprise to survive adversity and is distinguished from financial structure, where the latter includes short term debt and all reserves.

Capital Structure Covenants

Typical covenants include:

* Absolute debt limitation

¹ The definitions of many of the terms in this Glossary with some alterations are attributed to United Nations (1994) Manual on Business Planning, How to Construct a Business Plan for Energy Efficiency Projects, Economic Commission for Europe, Geneva.

- * Debt equity ratio
- * Debt service coverage

Cashflow

A narrow definition for funds flow, restricted to cash or cash equivalents. A statement based on this narrow definition is essentially a statement of capital and operating cash receipts and payments.

Co-financing

Any arrangement under which funds from the Bank are associated with funds provided by other sources outside the borrowing country in the financing of a particular project.

Commitment Fee

The fee paid to a lender for a formal line of credit. Normally, the fee is paid on the unutilized portion of the credit facility and ends when the entire line of credit is used.

Consolidated Financial Statements

These are the financial statements which present the assets, liabilities, shareholders accounts, revenue and expenses of an enterprise.

Cost Estimates

Forecast of probable cost to be incurred in the future.

Covenant

A written pledge or promise. Usually a provision in an agreement between two or more parties where each or all parties undertake to do or refrain from doing, a specific act.

Current Assets

The current assets should include:

- (a) Cash and bank balances for current operations. Cash or bank balances whose use for current operations are subject to restrictions should be included as a current asset only if the duration of the restrictions is limited to the term of an obligation that has been classified as a current liability or if the restrictions lapse within one year of the date of the report.
- (b) Securities not intended to retained and capable of being readily realised.
- (c) Trade and other receivable expected to be realised within one year of the balance sheet date. Trade receivables may be included in their entirety in current assets, provided that the amount not expected to be realised within one year is disclosed.
- (d) Inventories
- (e) Advance payments on the purchase of current assets.
- (f) Expense prepayments expected to be used up within one year of the balance sheet date.

Current Ratio

A measure of short term solvency and measures the ability of the firm to meet its short term debt obligations. The ratio is expressed as the current assets divided by the current liabilities.

Debt/Equity Ratio

Total debt to shareholders equity. The calculation may include current maturities of long term debt in the numerator and total net worth (including retained earnings and free reserves) in the denominator.

Debt Service

The aggregate amount of amortization (including sinking fund payments, if any) and interest and other charges on debt.

Debt Service Coverage Ratio (DSCR)

Ratio of ACF to debt service

Depreciation

The allocation of the depreciable amount of an asset over its estimated useful life.

Disbursements

The payment of funds from the loan account of a borrower either directly to the borrower as reimbursement for expenditures already incurred on items provided for in the project, or as a direct payment on behalf of the borrower to a consultant, supplier or contractor.

Equity

The net worth of a business, usually consisting of unimpaired paid-up capital, free reserves available or used for investments and non-returnable payments for capital purposes (such as grants).

Gearing

The extent to which the company uses long term debt or other senior fixed charge obligations to finance its assets.

Income Statement (Profit and Loss Account)

This is a summary of the revenues, operating and administrative costs, including depreciation, non-operational revenues, interest and taxes for the accounting period for an enterprise or project entity.

Interest on Long Term Debt

This is the interest associated with a long term debt the repayment of which is due more than one year.

Internal Rate of Return (IRR)

This is the discount rate where the net present value is set at zero.

Liquidity

Refers to a firm's cash (or near-cash) position and its ability to meet maturing obligations.

Liquidity Covenants

These are pledges to maintain a certain degree of financial liquidity. Typical covenants include: current ratio, quick ratio and dividend limitation covenant.

Loan Period

Total number of years from the date of effectiveness of the loan, which normally falls three months after signature, to its last payment or closing date.

Mezzanine (Sub-ordinated) Debt

Subordinated debt or preferred equity instrument lower in seniority to the other debt and claims on company's assets and is senior only to that of the common shares.

Operating Ratio

This is the relationship between the gross revenues and the operating expenditures.

Rate of Return on Capital Employed

This calculation expresses the net income after tax as a percentage of average funds (equity and long term debt) invested in an enterprise.

Revenue Covenants

The typical covenants include: rate of return on net fixed assets; rate of return on gross assets; rate of return on capital employed; cash generation; and operating ratio.

Revolving Fund

This is a fund established for a special purpose from which money is continuously expended, replenished, and again expended up to a defined limit - an ongoing credit facility. An example would be an energy efficiency revolving fund for projects aimed at energy efficiency.

Tranche

This is a payment (disbursement) by a lender of a portion of an agreed loan commitment.

Contents

GUIDE TO PROJECT FINANCE BUSINESS PLANS.....
1 HOW TO USE THIS GUIDE.....	10
1.1 <i>Purpose of Guide</i>	10
1.2 <i>A Guide for Beginners</i>	10
1.3 <i>Business Plan Form</i>	10
1.4 <i>Questions of Business Plan Form</i>	10
1.5 <i>Final Note Before You Start</i>	10
INTRODUCTION	12
1 SOME KEY ISSUES AND RELATED PROJECT RISKS.....	12
1.1 <i>Introduction to Project Risks</i>	12
1.2 <i>Sponsor Risk</i>	12
1.3 <i>Pre-completion Risk</i>	13
1.4 <i>Completion Risk</i>	13
1.5 <i>Technology Risk</i>	13
1.6 <i>Input and Supply Risk</i>	14
1.7 <i>Operation Risk</i>	14
1.8 <i>Approvals, Regulatory and Environmental Risk</i>	14
1.9 <i>Offtake and Sales Risk</i>	15
1.10 <i>Introduction to Securities and Guarantees</i>	29
1.11 <i>Security interest in project facilities or other tangible assets</i>	29
1.12 <i>Security arrangements covering completion</i>	29
1.13 <i>Security arrangements covering debt service</i>	30
1.14 <i>Supplemental credit support</i>	30
1.15 <i>Insurance</i>	30
1.16 <i>Governmental support and guarantees</i>	30
2 FINANCIAL ECONOMICS OF ENERGY MADE EASY.....	31
2.1 <i>Capital Costs of the Project and Depreciation</i>	32
2.2 <i>Operating Costs</i>	33
2.3 <i>Introduction to Investment Appraisal</i>	37
2.4 <i>Cash Flows</i>	37
2.5 <i>Payback</i>	39
2.6 <i>Discounted Cash Flow Methods (DCF)</i>	41
2.7 <i>Factors Affecting Investment Appraisal: A Detailed Example</i>	51
3 FINANCIAL APPRAISAL.....	55
4 INTERACTION OF INVESTMENT AND FINANCING DECISIONS.....	58
5 INTRODUCTION TO APPROVAL PROCESS.....	60
5.1 <i>Project Size</i>	60
5.2 <i>Initial Proposal</i>	60
5.3 <i>Concept Clearance</i>	61
5.4 <i>Initial Review</i>	61
5.5 <i>A Detailed Description of the Client Enterprise</i>	61
5.6 <i>Financial Statements audited to International Standards</i>	62
5.7 <i>Financial Projections</i>	62
5.8 <i>Relevant Laws</i>	62
5.9 <i>Environmental Information</i>	62
5.10 <i>Project Preparation</i>	62
5.11 <i>Letter of Information</i>	62
5.12 <i>Final Review</i>	62
5.13 <i>Board Review</i>	63
5.14 <i>Signing/ Financial Closure</i>	63
PROJECT SUMMARY.....	64
1 LEGAL NAME OF SPONSOR.....	64
2 CONTACT PERSON AND LOCATION OF SPONSOR.....	64
3 LEGAL STATUS OF SPONSOR.....	64
4 IDENTITY AND LOCATION OF PARTNERS.....	64
5 SECTOR.....	64
6 BRIEF PROJECT DESCRIPTION.....	65
7 TYPE AND AMOUNT OF FINANCE REQUIRED.....	65
7.1 <i>Type of Finance Requested</i>	65
7.2 <i>Total Project Cost</i>	65
7.3 <i>Amount of Finance Requested</i>	65
7.4 <i>Other Sources of Finance</i>	65
8 EXPECTED REVENUES PER YEAR.....	66

9	ENERGY PRICES (EURO).....	66
10	LIFETIME OF THE PROJECT	66
11	EXPECTED IMPLEMENTATION TIME	66
12	PROPOSED START OF IMPLEMENTATION	66
13	SUMMARY CASH FLOW ANALYSIS	66
14	DATA TABLE	67
BUSINESS DESCRIPTION		68
1	NATURE OF THE BUSINESS	68
2	STRENGTHS OF THE BUSINESS.....	69
3	RISKS.....	69
4	CURRENT SITUATION	69
5	FUTURE PLANS	69
NATURE OF THE PROJECT.....		70
1	BACKGROUND TO THE PROJECT	70
2	SCOPE OF THE PROJECT	70
3	RATIONALE FOR THE PROJECT.....	70
4	ARRANGEMENTS FOR IMPLEMENTATION.....	70
5	INFRASTRUCTURE BACKGROUND.....	70
6	DESCRIPTION OF SUPPLIES.....	70
BENEFITS.....		71
1	REVENUES AND ENVIRONMENTAL IMPROVEMENTS	71
2	EXPORT PROMOTION.....	71
3	IMPORT SUBSTITUTION.....	71
4	JOB CREATION.....	72
5	PRODUCTIVITY IMPROVEMENTS	72
6	TECHNOLOGY TRANSFER.....	72
7	MANAGEMENT DEVELOPMENT	72
THE SPONSORS.....		73
1	BACKGROUND.....	73
2	FINANCIAL DATA.....	73
3	PROPOSED FINANCIAL CONTRIBUTIONS AND EXPOSURES.....	73
4	RATIONALE FOR INVOLVEMENT OF OTHER PARTNERS, IF ANY	73
5	OBJECTIVES.....	73
5.1	<i>What are the objectives of the business itself?.....</i>	<i>73</i>
5.2	<i>What are the long term objectives of the business (if any)?.....</i>	<i>73</i>
PROJECT COSTS AND TIMESCALE.....		74
1	PROJECT COSTS	74
1.1	<i>Background Information.....</i>	<i>75</i>
1.2	<i>Energy and raw materials consumption</i>	<i>75</i>
1.3	<i>Basis for the cost estimate</i>	<i>76</i>
1.4	<i>Sources and dependability (condition and age) of technology and equipment</i>	<i>77</i>
1.5	<i>Assistance to be provided by the technology supplier.....</i>	<i>78</i>
1.6	<i>Timetable of Implementation and Disbursements</i>	<i>78</i>
2	FINANCIAL FEES.....	78
3	ARRANGEMENTS FOR IMPLEMENTATION.....	79
3.1	<i>Description of contractors in charge of implementing major components of project and rationale for their selection</i>	<i>79</i>
3.2	<i>Nature of the contracts with the contractors in charge of implementation.....</i>	<i>80</i>
3.3	<i>Explanation of any cost contingency built into the project costs.</i>	<i>80</i>
3.4	<i>What is the proposed method for purchasing goods, services and equipment with the bank's funds?</i>	<i>81</i>
3.5	<i>What is the justification for using any other method?.....</i>	<i>81</i>
3.6	<i>Is there any reason not to use competitive tendering?.....</i>	<i>81</i>
4	PROCUREMENT ISSUES.....	81
PRODUCTS SERVICES AND MARKETS		83
1	DESCRIPTION OF PRODUCTS OR SERVICES	83
2	PRICING AND COSTS (BREAKDOWN OF THE COST OF MATERIALS)	83
2.1	<i>Sources of cost estimates</i>	<i>83</i>
2.2	<i>Explanation of price estimates</i>	<i>83</i>
3	MARKET DESCRIPTION, LOCATION AND SIZE	83
3.1	<i>Description of the market that the business is in:.....</i>	<i>83</i>
3.2	<i>Geographical area of the company's market.....</i>	<i>84</i>

3.3	Size of the company's market (EURO per year).....	84
3.4	Description of the market environment.....	84
4	TYPE OF CUSTOMERS - CHARACTERISTICS OF CUSTOMERS OF THE BUSINESS.....	84
5	COMPETITOR'S ANALYSIS	84
6	WHAT IS SPECIAL ABOUT YOUR OWN PRODUCT OR SERVICE? (WHAT IS ITS UNIQUE SELLING POINT, IF ANY?)	84
6.1	Advantages of your product or service over the competition	85
7	FACTORS AFFECTING THE GROWTH OF DEMAND	85
7.1	Description of factors affecting growth of demand	85
7.2	Is the company's market growing, stable or in decline?.....	85
8	FINANCIAL POSITION OF BUYERS	85
REGULATIONS AND ENVIRONMENT INFORMATION		86
1	KEY REGULATIONS REQUIRED FROM THE AUTHORITIES	86
2	KEY PERMISSIONS REQUIRED FOR THE TRANSACTION	86
3	PERMIT REQUIREMENTS	86
4	ENVIRONMENTAL REGULATIONS	86
5	ENVIRONMENTAL INFORMATION.....	86
5.1	Introduction	86
5.2	Environmental Due Diligence.....	87
5.3	Environmental Audit.....	87
5.4	Environmental Assessment (EA).....	87
5.5	Guidelines for Environmental Due Diligence.....	87
6	ENVIRONMENTAL CONTACT PERSON	88
7	THE LAND	88
7.1	Location	88
7.2	Historical uses of land.....	88
7.3	Current land uses associated with the project site.....	88
8	PHYSICAL CONSTRUCTION ACTIVITIES INVOLVED IN THE PROJECT.....	88
9	ENVIRONMENTAL IMPACT ASSESSMENTS OR ENVIRONMENTAL AUDITS CARRIED OUT FOR THE PROJECT.....	88
10	POTENTIAL ENVIRONMENTAL LIABILITIES ASSOCIATED WITH PROPERTY	88
11	PROPOSED MEASURES FOR ENVIRONMENTAL MITIGATION.....	88
12	PROPOSED MEASURES FOR ENVIRONMENTAL ENHANCEMENT	89
13	CORPORATE ENVIRONMENTAL POLICY	89
14	ENVIRONMENTAL CONCERNS ASSOCIATED WITH THE PROJECT OR ITS ASSOCIATED PROPERTIES.....	89
15	STATUS OF PUBLIC CONSULTATION ON THE PROJECT	89
ROLE OF THE BANK.....		90
1	DESCRIPTION OF THE ROLE OF THE BANK.....	90
THE FINANCING PLAN		91
1	PREPARING A FINANCING PLAN	91
2	OBJECTIVES.....	91
3	CONSTRUCTION FINANCING CONSIDERATIONS.....	92
4	LONG TERM FINANCING (TAKE OUT FINANCING)	92
4.1	Maximum Feasible Debt/Equity Ratios	92
4.2	Timing of Drawdowns.....	93
4.3	Expected Cash Flow Projections.....	93
4.4	Currency Exposure of Project Revenues and Costs	93
4.5	Expected Useful Economic Life of the Project	93
4.6	Sources of Supply and Equipment for the Project.....	93
4.7	Long Term Financing	94
4.8	With-holding Tax.....	94
4.9	Estimate of the Project's Borrowing Capacity.....	94
4.10	Annual Coverage Tests	95
5	INTRODUCTION.....	95
6	CURRENT AND REQUIRED SOURCES OF FINANCE	96
7	TYPE OF FINANCING REQUIRED	97
CASH FLOW PROJECTIONS		98
1	INTRODUCTION.....	98
2	DEFINITION OF OPERATING CASH-FLOW	98
3	DERIVING CASH-FLOWS FROM RAW DATA.....	99
4	DERIVING CASH-FLOWS FROM PROJECTED FINANCIAL STATEMENTS.....	99
4.1	Working Capital	99
4.2	Interest: Not Included in Cash-flow.....	100

4.3	<i>Only Fixed Overheads Included in Cash-flow</i>	100
4.4	<i>Taxation</i>	100
5	OTHER CONSIDERATIONS IN CASH-FLOW ANALYSIS	102
5.1	<i>Sunk Costs</i>	102
5.2	<i>Incidental Costs and Benefits</i>	102
5.3	<i>Opportunity Cash Flows</i>	103
6	CONVERSION INTO CASH	103
7	STRATEGIC OPTIONS	103
8	CHECKLIST OF PRACTICAL TIPS	104
9	COMMENTARY ON THE CASH-FLOW PROJECTIONS.....	104
9.1	<i>Operating Profit</i>	104
9.2	<i>Working capital</i>	105
9.3	<i>Taxation</i>	105
9.4	<i>Capital Expenditures</i>	106
9.5	<i>Free cash-flow (pre-finance)</i>	106
9.6	<i>Servicing of Finance</i>	106
9.7	<i>Financing</i>	106
9.8	<i>Ratios</i>	107
	PRO-FORMA FINANCIAL STATEMENTS.....	108
1	INTRODUCTION	108
2	STAGE 1 PRE-FINANCE	108
3	STAGE 2 WITH FINANCE.....	108
4	STAGE 3 DIFFERENTIAL BETWEEN STAGE 1 AND STAGE 2	108
5	FORECASTED INCOME STATEMENT	108
6	FORECASTED BALANCE SHEET	109
6.1	<i>Introduction</i>	109
6.2	<i>Assets</i>	109
6.3	<i>Liabilities</i>	110
7	FORECASTED CASH FLOW	110
8	FORECASTED RATIOS	111
9	FINANCIAL MODELLING.....	112
9.1	<i>Estimating Total Costs</i>	112
9.2	<i>Contingency for Cost Over-runs</i>	112
9.3	<i>Capital Costs</i>	112
9.4	<i>Ownership Structure</i>	112
9.5	<i>Project Economics</i>	112
9.6	<i>Cash-Flow Projections</i>	112
9.7	<i>Currency Assumptions and Risk</i>	112
9.8	<i>The Project's Debt Capacity</i>	112
9.9	<i>Interest Rate Risk</i>	113
9.10	<i>Rates of Return for Different Investors</i>	113
9.11	<i>Passive Equity Investors</i>	113
9.12	<i>The Sponsor's Equity</i>	113
9.13	<i>Sensitivity Analysis</i>	113

1 How to Use this Guide

1.1 Purpose of Guide

It should be remembered that the decision makers in banks have only a limited time to examine a proposed project before making their decision whether to proceed with the loan approval process. A badly presented or incomprehensible proposal stands the risk of being turned down without being fully examined. In order to overcome this problem, this Guide is designed to help potential project sponsors understand how to write a business plan and how to present it.

1.2 A Guide for Beginners

This Guide is not meant to be read straight through but rather to be used like a reference which you consult according to your purpose. We recommend that you examine the Table of Contents and scan through the Guide to get a feeling for its structure and organisation.

If you are new to the project preparation, then it is suggested that you begin from the beginning, reading the first chapters prior before attempting to write a business plan. The first chapter is designed to help the reader understand the context, key issues and requirements of bankable proposals. Therefore a comprehensive understanding of the content of the preliminary chapter will help smooth out the process of writing the actual business plan.

1.3 Business Plan Form

After reading the first chapter the reader may try completing a business plan form. This is the core of the book and it is the form which a sponsor may use for project proposals requesting finance from an International Financial Institution. The Business Plan is a tool whose value depends on how well you use it. Therefore special care and attention needs to be given to every item of the Form. Missing essential elements may cause unnecessary delays in the approval process.

It is recommended that the Business Plan Form be photocopied and the copy be used as preliminary worksheets to help you draft your own business plan. You should attempt to fill out as many of the blanks as possible and to take note of those areas which require further research. The Form will help you document what types of information you need to gather.

1.4 Questions of Business Plan Form

Should you be unsure of the meaning of any section of the Form, then you can turn to the Commentary to the Business Plan Form which describes each of the requirements in detail and provides "planning notes" and "questions" aimed at clarifying the purpose, scope and relevance of each section.

1.5 Final Note Before You Start

If you had all the information at your fingertips, you could write the business plan within few days! But there is a lot of information required. Learning how to write a business plan is a fundamental step which all business people must learn if they are to gain maximum returns on their investments.

The form has been designed for the eventual reader. In most cases, this is a busy manager or analyst in the corporate investment department or the external financial institution which is to be asked to fund the work. As a result, the form and supporting material begins with a summary and progressively provides additional details. With a few exceptions, this is the opposite of the way in

which the form would be constructed if it was designed solely for the person or team compiling the information.

Therefore, when planning the completion of the form, the following should be taken into account:

1. In circumstances where the approach and much of the detailed planning for a project is already well known, it is normally more beneficial to complete the detailed aspects of the form before the summary.
2. However, if a project is at a very early stage and it is not yet completely clear how the project is to be structured, it can be both slow and potentially error-prone to begin by developing the plans for the project at the detailed level. In these circumstances, it can be a very useful technique to clarify the overall strategy for the project before developing the detailed plans. This approach is achieved by completing the summary form before beginning on the most detailed areas of definition.

INTRODUCTION

1 Some Key Issues and Related Project Risks

1.1 Introduction to Project Risks²

In writing a business plan, the sponsor must address the specific risks of the project with the aim of presenting a clear plan of how to overcome these risks, either by mitigation or by laying them off to other parties. In order to understand what these types of risks are, we will discuss the key areas of concern for energy and industrial projects.

Each project has a different risk profile, that is, each project will have different kinds of risks and the magnitude of risks will differ from project to project. In general, however, there are key areas of risk which every proposer should be aware of and should keep in mind when planning to write a business plan. These key areas of risk are:

- 1 Sponsor risk
- 2 Pre-completion risk
- 3 Completion risk
- 4 Technology risk
- 5 Input or Supply risk
- 6 Operating Risk
- 7 Approvals, Regulatory and Environmental risk
- 8 Offtake and Sales risk

It has to be noted, that bioenergy projects carry a specific set of risks, which would need to be adequately explained in the business plan presentation, including their severity, probability and potential effects on the project. Clear and well documented mitigation/avoidance risk control strategy needs to be drawn and costed.

Energy projects face a number of risks – like the risks of energy and fuel markets traditional risks of demand, fluctuating markets and changing regulations.

The Bank will expect from the sponsor a clear analysis of each of these risks and how the sponsor thinks he can mitigate them. We will now discuss each of the above risks in turn.

1.2 Sponsor Risk

Sponsor risk is extremely important and recent discussions with project lending banks suggest that it is becoming more rather than less important in the current market. Sponsor risk is closely associated with completion risks. The bank's view on completion risk will be strongly influenced by their view of sponsor risk.

Sponsor risk may be broken down into two elements:

- 1 Equity commitment and
- 2 Corporate strength and experience (so called, "corporate substance").

²The source for the ideas on project risks are quoted with kind permission from Gregg Haddock (May 1995) "Financing Renewable Energy Projects" in **Innovative Financing Schemes for Energy and Environmental Technology and Services**, Workshop Tuesday, April 11, 1995 Proceedings, Luxembourg-Kirchberg, Chambre des Metiers, European Commission, Directorate-General XVII - Energy. Mr. Haddock works in project finance for Sumitomo Bank, Limited, London.

Regarding equity, lenders will normally require a contribution of anything from 15 to 50% of the project cost to ensure the sponsor's continued commitment.

Regarding corporate substance, regardless of whether the lender is seeking pre-completion guarantees from the sponsor, the banks predictably like to work with corporate sponsors with substantial technical expertise and financial "depth".

The backstop value to a bank of a sponsor who can commit resources, either financial or technical to turning around a problematic project is very great. Therefore entrepreneur sponsors of energy or industrial projects--who will often not have the same corporate "substance" as major companies--should anticipate and prepare for a discussion with potential lenders on this issue.

The attitude of potential lenders towards sponsor risk is a key factor in steering many sponsors towards inviting a more substantial sponsor to enter into a joint venture arrangement. This will usually have the effect of reducing sponsor risk in the eyes of a potential lender. Smaller sponsors should not assume however that it would be a waste of time to approach bankers before the support of a more substantial partner has been negotiated. This is especially true for smaller sized projects which are not dependent on large infrastructure development. On the contrary--if the original sponsor is aware in detail of the type and extent of support the banks will require from the equity investor(s) in a project, he will be in a much stronger position when negotiating the terms of any joint venture with a new partner. Indeed, banks may be very helpful in finding potential joint venture partners, as will a good financial adviser.

1.3 Pre-completion Risk

Banks are willing in certain circumstances to assume pre-completion risk for projects, i.e. they may be prepared for their lending to be limited in recourse to the project itself before completion occurs. Acceptance of pre-completion risk is by no means the norm however. Often banks will require some kind of external recourse until completion, such as a guarantee from third parties such as the owners of a project-owning joint venture company. Entrepreneur sponsors in particular should therefore be prepared for lender concern on the issue of pre-completion risk as they will usually not be able to offer blanket guarantees of such risks which would be acceptable to the lender. The sponsor, possibly with the help of a financial adviser, should analyse the pre-completion risk issues likely to be raised by potential debt providers and should be in a position to demonstrate that:

- The pre-completion risks involved are modest;
- Everything possible has been done to mitigate these risks or to lay them off elsewhere.

Lenders will require adequate insurance to be in place against physical damage, consequential loss and third party and public liability. Such insurance is important during the pre-completion, completion and operation phases. A good insurance adviser will be able to assist in this area.

1.4 Completion Risk

Lenders will focus upon the cost-overrun and time-delay risks of project completion in great detail. This is the period of highest risk for lenders. They may face a total write-off in respect of a project which never produces cash flow. Lenders will seek to minimise this risk by requiring fixed-price "turnkey" contracts to be negotiated with the contractors. They will also analyse whether the various contractors are financially sound and whether their obligations are covered by performance bonds or third party sureties. It may be possible, subject to the robustness of the project economics, to pre-agree a debt-funded cost overrun contingency facility, or indeed to raise additional equity up-front to cover this risk.

1.5 Technology Risk

Banks pay a great deal of attention to technology risk . Because of their risk-reward relationship with a project, bankers are keen to limit risk and, in particular, they will always seek to avoid accepting risks which should properly be taken by the equity owners of the project. Any technology which is at the "leading edge" of current practice will certainly be placed in this category. As a technology becomes more established banks may become comfortable with the predictability of the processes involved and may in the rare occasion begin to accept the technology risk. Even for such technologies , however, project sponsors should be prepared for a detailed examination of the technology risk issue by potential debt-providers and should seek in their initial paper to demonstrate:

- That the technology has a satisfactory track-record
- That the contractor building the project has experience of the technology
- The adequacy of the guarantees and warranties which have been negotiated
- The ease with which maintenance and, if necessary, component replacement can be carried out
- That the availability and efficiency levels predicted can be easily achieved.

Potential lenders may also require the opinion of an independent technical consultant on the project.

1.6 Input and Supply Risk

The input and supply risk is the risk relating to the provision of the relevant source of energy and raw materials to the project in question. Where there is a distinct (and finite) supply of fuel for a project, bankers will look for an independent corroboration of the sponsor's reserve figures by a reputable consultant. Given the risk-reward relationship the banker has with the project, he will typically wish to concentrate on any "core" reserves which have the highest degree of certainty and to have his debt repaid well within the predicted economic life of these reserves. Even when there is no reserve factor to be considered project sponsors should, when approaching potential financiers, be prepared to demonstrate the security of supply arrangements, including the basis of pricing of the fuel. The sponsors' presentation should show that the assumptions made relating to the quantities and pricing of fuel are conservative and that even on this basis the proposed debt can be retired with a significant margin of safety. It is likely that a lender will wish to take security over any fuel supply contracts and this factor should be borne in mind by sponsors when contracts are being drawn up.

1.7 Operation Risk

Operation risk is the risk to the forecasted cashflow arising from the failure of operations of the project. Just as banks will wish to ensure that the contractor employed to construct a project is competent and financially sound they will also wish to satisfy themselves that the operating team engaged to run the project is skilled in the employment of the relevant technology and able to deal with all foreseeable situations, whether they are routine or require additional inputs of skills and resources. Banks often derive significant comfort from the employment by a project sponsor of a third-party operations and maintenance ("O&M") contractor, because of the deeper reserves of skills and personnel which this can make available to a project and because O&M costs can thereby be contractually fixed. Sponsors are well advised to consider this option, even though it may involve greater expense, because of the additional "comfort factor" which it provides to lenders. Sponsors should also take great care to review the efficiency levels, downtimes and outages which are predicted in the cashflows they provide to banks. It is better to predict easily achievable levels of efficiency and availability and refer to the higher levels which may be achieved than to present a base case with levels set at the high end of what can be achieved, even if the sponsor thinks that these targets can be met.

1.8 Approvals, Regulatory and Environmental Risk

The risk of not obtaining necessary regulatory approvals to begin a project should be considered conditions precedent to any proposal. There is also the risk that other regulatory risks, such as environmental risk, may live to haunt the lenders if the transaction should fail and decontamination costs should have to be borne by the lender who takes possession of the security in order to satisfy the outstanding loan. The environmental and regulatory considerations should be explicitly set out in the business plan and are to be found in the relevant sections of the Business Plan Form. In this section, we shall discuss the concerns which bankers have in regards to this risk.

Lenders are increasingly concerned to protect themselves against the consequences of a project breaching official consents and guidelines, especially in the environmental field. It is already the case in the USA and the UK that lenders who take possession of their security when a project fails to perform may themselves be liable for the legal consequences of pollution caused by that project. The position is not so hard and fast in other countries, but bankers are concerned that the increasing trend towards environmental regulation at all levels of government -- local, national and supranational -- might increase the danger of them being forced to meet vast claims arising out of pollution caused by borrowers.

It is essential therefore when approaching a potential lender to prepare and present full details of all consents and approvals--planning, environmental, generating license, certification of produce, etc.--which are expected to be required and the status of the efforts being made to obtain such consents. Evidence should also be provided of the ability of the proposed project to meet all present and likely future constraints and limits. Foreseeing what environmental and planning agencies might impose by way of constraints in the future is clearly not an easy task, but a banker being asked to rely on a project's cashflow for repayment over say a 7-year period will wish to assess and limit the risk of the project being closed down by environmental regulators when the debt raised to build it is only partly repaid.

Banks will not necessarily require all consents and approvals to be in place before they will negotiate a financing structure, but sponsors should expect the granting of all necessary consents to be a "condition precedent" to be fulfilled before any loan funds can be drawn.

Sponsors should expect potential lenders to take detailed legal advice on this issue.

1.9 Offtake and Sales Risk

The offtake and sales risk is the risk that the project may fail to generate adequate income. A lender can only be repaid when a project is generating cash and therefore banks have an acute interest in all aspects of the "offtake" or sales risk. Only in rare cases will project lenders accept the "volume" risk, that is, the danger that the output from a given project will not find a purchaser at all. Whether or not they will accept the risk of an acceptable price being achieved for the project's output will depend on a number of factors including the maturity of the market for such products and the volatility of prices in such markets. Both of these factors should be stated in the business plan.

The availability of long-term, guaranteed-price energy and product(s) purchase contracts is a key element in substantially eliminating the volume and price risks from energy projects. Some contracts may offer banks an outstanding "offtake" agreement whereby the purchaser of the energy and products is of undoubted financial standing and the generator/producer has the ability to set output pricing over the life of the contract.

Sponsors should expect lenders, as a general rule, to require the repayment of their loans during the life of any such preferential offtake contract or, if they are prepared to consider having a portion of the debt repaid after the volume and price risk have re-emerged, to take a very conservative view of likely price trends.

Sponsors should also take into account that lenders will almost certainly wish to take a security interest in sale contracts.

Example of Risk Matrix

RISK MATRIX

Energy projects

Risk = severity*probability (Haimes)

Risk = severity*relative frequency (Bahill)

Residual risk = risk - mitigation

Risk-tier	Description
Purchaser of energy products, Utility company or grid	Risks related to operations and market: not meeting demand, brownouts, blackouts, etc.
Project Management/Development	Risks that may be encountered throughout the development of the energy project: changes in costs, design issues, permit issues, climatic and fuel risks, etc.
Hardware	Risks related to the hardware components of the system: machinery and equipment reliability
Environmental and Social	Risks related to the location and surrounding environment of the project: effect on local habitats, weather, environmental opposition, etc
Government	Risks related to changes in governmental policies and priorities

Risk Severity and Frequency numerical values

Description	Metric
Extreme	Purple
Very High	Light purple

High	Red
Medium	Light red
Low	Yellow
Very Low	Light Yellow
Negligible	Green

Risk Control Strategies*

Avoid	Change the project plan to eliminate the risk or to protect the project objectives (time, cost, scope, quality) from its impact. This can be achieved by modifying scope, adding contingency to the project plan either as additional time for critical path activities, or adding resources. Some threats that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication, or acquiring expertise.
Mitigate	Reduce the probability and/or impact of an adverse risk event to an acceptable threshold. Taking early action to reduce the probability and/or impact of a risk is often more effective than trying to repair the damage after the risk has occurred. Risk mitigation may take resources or time and hence may represent a trade off. However, the overall result may reduce risk to the overall project objectives
Transfer/Share	Shift the negative impact of a threat to a third party through: insurance, performance bonds, warranties, guarantees, incentive/disincentive clauses, cost+time contracts, provided the price for the risk transfer can be supported by project cash flow. Transference reduces the risk only if the person to whom the risk is transferred (such as the contractor) is better able to take steps to reduce the risk and does so. Risk transference nearly always involves payment of a risk premium to the party taking on the risk.
Acceptance	Adopted if is either not possible to eliminate that risk from a project or the cost in time or money of the response is not warranted by the potential impact of the risk. The most common active acceptance strategy is to establish a contingency reserve, including amounts of time, money, or resources to handle the threat or opportunity.

*source: Arthur D Little

Events	Potential effect	Frequency (event/year)	Severity	Estimated risk	Mitigation/Strategy	Risk Control Strategy	Risk taker	Notes (examples)
1. Technical								
Performance of technology	Lower yield = lower revenues Losses = lost production x tariff/price	Continued	High	Low	Proven technology Quality components Correctly dimensioned Manufacturer warranties and performance guarantees and terms	Transfer	Manufacturer, EPC Contractor	Technology to be provided by Manufacturer. Full performance guarantees by the manufacturer and EPC.
Technical Availability	Lower yield = lower revenues Losses = lost production x tariff/price	Low	High	Low	Proven technology Quality components Correctly dimensioned Manufacturer warranties and performance guarantees and terms O&M guarantees	Transfer	Manufacturer, O&M Contractor	Technology to be provided by Manufacturer. Full performance guarantees by the manufacturer and O&M contractor.
Technical Lifetime	Reduced return from the project	Low	Medium	Low	Proven technology Quality components Correctly dimensioned Manufacturer warranties and performance guarantees and terms O&M guarantees	Transfer	Manufacturer, O&M Contractor	Would reduce the return to the equity holders. Lifetime guarantee by Manufacturer and O&M contractor
Equipment defect / decreasing yield (degradation)	Lower yield = lower revenues Losses = lost production x tariff/price	Low	Medium	Low	Manufacturer warranties and performance guarantees and terms O&M guarantees	Transfer	Manufacturer, O&M Contractor	Degradation rate guaranteed by the manufacturer
Reduced yields due	Lower yield = lower revenues	High	High	Medium	O&M guarantees	Transfer	Insurance, O&M Contractor	Would reduce the yield severely, insured, hedged yields, application of protection measures /materials
Connection to the grid	Power cannot be	High	High	High	Substation constructed with the	Transfer, Accept	Utility	Power cannot be evacuated, needs

fails	evacuated				project Take-and-pay PPA			provision in the PPA (take-and-pay)
Financial strength manufacturer (low risk of default = capability to fulfil guarantees)	Inability to fulfil warranties and guarantees	Low	High	Low	Track record, financial strength of mother company	Transfer	Manufacturer	Technology to be provided by Manufacturer.
Technological change	Equipment gets cheaper in future. Equipment gets more efficient	High	High	Low - in medium term	Distrust of project cost, resentment by the utility and users of electricity	Accept	sponsor/utility	The technology supplied conforms to the best practice of the day Manufacturer performance guarantees
2. Energy Resource								
Variability of climate data	Uncertain yield	Medium	High	Low	Use of different data bases, on-site measurements	Mitigate	Developer/Consultants	A number of climate data and models to be used by the developer, using reputable consultants to perform the feasibility studies. Theoretical data to be combined with on site measurements.
Quality of climate data	Overestimation of yield	Medium	High	Low	Use of proven databases with well correlated theoretical and empirical data. Use of on-site measurements.	Mitigate	Developer/Consultants	A number of climate data and models to be used by the developer, using reputable consultants to perform the feasibility studies. Theoretical data to be combined with on site measurements.
Simulation Model	Overestimation of yield	Medium	High	Low	Use of proven models. Use of conservative P90 values.	Mitigate	Developer/Consultants	A number of climate data and models to be used by the developer, using reputable consultants to perform the feasibility studies. Theoretical data to be combined with on site measurements.

3. Severe Weather Event								
Drought	Damage yields	High	High	Low	Use of protection measures, if possible	Transfer, Mitigate, Accept	Designer/Owner, EPC contractor	Appropriate measures to be incorporated in the installation design and selection, Insurance
Extreme wind conditions	Damage of installation	High	High	Medium	Use of technical protection measures	Transfer, Mitigate, Accept	Designer/Owner	Appropriate measures to be incorporated in the selection, installation's design, Insurance
Extreme temperatures	Low yields, performance /damage	High	High	Medium	Use of technical protection measures	Transfer, Mitigate, Accept	Designer/Owner	Appropriate measures to be incorporated in the selection, installation's design, Insurance, good resistance of Manufacturer performance to high temperature
Flood	Damage of installation	Low	Medium	Medium	Site selection	Transfer, Mitigate, Accept	Designer/Owner	Appropriate measures to be incorporated in the selection, installation's design, Insurance
Sand storm	Damage of installation/low performance	High	High	High	Use of technical protection measures	Transfer, Mitigate, Accept	Designer/Owner	Appropriate measures to be incorporated in the selection, installation's design, Insurance
Dune movement	Damage of installation	High	High	Medium	Site selection	Transfer, Mitigate, Accept	Designer/EPC	Appropriate measures to be incorporated in the selection, installation's design, Insurance
Earthquake	Damage of installation	Low	High	Low	Site selection	Mitigate, Accept	Designer/EPC contractor	Appropriate measures to be incorporated in the installation's design, Insurance
4. Costs Forecast								
CAPEX	Underestimates can lead to lack of funds to complete the project	Medium	High	Low	The cost estimates to be based on recent quotes from the manufacturer/suppliers. Fixed price EPC.	Transfer	Sponsor/EPC contractor	The budget will be based on fixed price EPC contract

Fixed OPEX	Underestimates can lead to reduced cashflow	Medium	High	Low	The cost estimates to be based on recent quotes from the O&M contractor. Fixed price O&M with escalation built-in into the financial model.	Transfer	Sponsor/O&M contractor	The budget will be based on fixed price O&M contract
Variable OPEX	Underestimates can lead to reduced cashflow	Medium	High	Low	The cost estimates to be based on the on-site conditions (dust, wind rain etc.).	Transfer	Sponsor/O&M contractor	The model will consider the severity of the weather environmental conditions
Maintenance Reserve Account (equipment replacement)	Underestimates can lead to reduced cashflow	Medium	High	Low	The cost of replacement to be build-in in to the financial model, sufficient MRA to be envisaged in the budget	Transfer	Sponsor	The model will consider the replacement needs based on the technical characteristics provided by the manufacturer. Strong performance guarantees to be requested.
5. Construction Risks								
Cost overrun / adjustments	Can lead to lack of funds to complete the project and /or increase the time for yields	Medium	Medium	Low	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) for equipment Completion Guarantees Monitoring reports Performance reports Penalty clauses Project's budgeted costs will include cost contingency funds	Avoid, Transfer, Mitigate	Manufacturer, EPC Contractor, Owner	Installation to be provided by Manufacturer.
Equipment Delivery Delays	Delay in completion, loss of revenue, penalty for late completion under PPA	Medium	Medium	Low	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) Completion Guarantees	Avoid, Transfer, Mitigate	Manufacturer, EPC Contractor	Installation to be provided by Manufacturer.

					Monitoring reports Performance reports Penalty clauses			
Transportation Price	Cost overrun	Medium	Medium	Low	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) Completion Guarantees Monitoring reports Performance reports Penalty clauses	Transfer, Mitigate	Manufacturer, EPC Contractor	Transportation rate to be included in the purchase contract.
Completion delay / Non-completion	Delay in completion, loss of revenue, penalty for late completion under purchase contract, PPA	Medium	High	Medium	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) Completion Guarantees Monitoring reports Performance reports Penalty clauses	Transfer, Mitigate	Manufacturer, EPC Contractor	Appropriate measures to be incorporated in the completion guarantees, Insurance
Sub-contractors	Sub-standard work	High	Low	Low	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) Completion Guarantees Monitoring reports Performance reports Penalty clauses	Transfer, Mitigate	Sponsor/EPC contractor	To be included in the EPC contract guarantee and completion bond.
Meeting Project specification	Reduced performance	High	Low	Low	Fixed time and budget turnkey contract (Engineering Procurement and Construction Contract (EPC)) Completion	Transfer, Mitigate	Manufacturer, EPC Contractor	To be included in the EPC contract guarantee and completion bond.

					Guarantees Performance guarantee Monitoring reports Performance reports Penalty clauses			
Land availability	Inability to construct the project	Medium	High	Low	Exclusive land lease agreements with the Local Government/land owners	Avoid, Mitigate	Sponsor/EPC	Full support of the state government. The Sponsor will make its best endeavours to select land for the projects that allows appropriate agricultural use and also where minimum or no resettlement is required.
6. Off-take risk								
Demand / Price and Quantity	Can lead to decreased project income Lower yield = lower revenues	High	Medium	Medium	Long-term Off-Take-Agreement (PPA) take-and-pay	Transfer, Mitigate	Sponsor/Off-taker/ Government	Full price and quantity guaranteed by the off-taker. Typical forms of credit enhancement to be provided.
Tenor	Reduced return from the project	Low	Medium	Low	Long term PPA – 20 years Signing a long term PPA and Project Support Agreement with the relevant State and local authorities to counter the risk of arbitrary changes of tariff, accelerated taxes, regulations etc	Mitigate	Sponsor/Off-taker	Negotiated PPA including: sale and purchase of energy on take-and-pay basis, defaults and remedies, liquidated damages, warranties, control and operation, metering, tariff billing and payment, insurance, liability and indemnification, termination, taxes and law.

Financial strength of purchaser	Can lead to lack of funds to continually purchase the product	Low	Medium	Low	Credit enhancement, Commercial and political insurance, undertaking from the Government.	Mitigate, Transfer	Sponsor/Off-taker / Government	Strong political and institutional support from the State Government
7. Financing risks								
Interest Rate volatility	Increased interest payments, lowering the DSCR	Medium	Medium	Medium	Fixed rate Hedging Financial Covenants	Transfer	Borrower, Lender	The interest rate increases can be contained by fixing the rate, capping it and hedging it. To be considered at Term Sheet negotiations.
Currency	Devaluation of currency in a foreign currency loan will result in reduction of the ability to repay the loan	High	High	High	Hedging Financial Covenants Market Flex PPA	Transfer	Borrower, Lender	A hedging must be arranged to protect from currency devaluation. If the currency value changes between term sheet and loan agreement, the loan terms can be changed (market flex). A provision in the PPA can stipulate a tariff correlated to the currency of the loan.
Inflation	High inflation can result in increase to increase of the O&M costs	High	Medium	Low	Fixed O&M Hedging	Transfer	O&M contractor	The O&M contract can be fixed with a fixed % indexation/year and the risk of inflation hedged.
Refinancing Risk	Should the project returns worsen, the refinancing on better rates and conditions would become less attractive	Medium	Medium	Low	Financial Covenants	Accept	Borrower	Increased perception of risks and worsening market would make finding cheaper refinancing difficult.
Violation of Terms	Would result in default	Medium	Very high	Medium	Financial Covenants Insurance	Mitigate, Transfer	Borrower, Insurer	Such risks, particularly related to political and commercial will need to be insured in the interest of Borrower, or accepted and

								managed by the lender (if DFI).
Syndication	Risk of unsuccessful syndication would lead to not sufficient funds to finance the project	Medium	High	medium	Overall risk mitigation Attractive terms Financial Covenants Market Flex	Mitigate, Avoid	Sponsor, MLA	The risks, terms and conditions are attractive to other lenders. The MLA approaches financial institutions, which accept the terms.
8. Permitting issues								
Land License/Lease agreement	Inability to construct the project	Medium	Medium	Low	Exclusive land lease agreements with the Local Government/owners	Avoid, Mitigate	Developer/Consultants	xx land has been identified for the project in Location. The State Government of Location, as a partner to the project
Connection approval	Inability to distribute the electricity	Medium	High	Low	Exclusive Off-Take agreements with the Bulk Trader () and connection agreement with GRID OPERATOR.	Avoid, Mitigate	Sponsor/ Off-taker	The projects are sited in a proximity of the grid.
Environmental Approval	The project has high environmental impact	Medium	High	Medium	Use of environmental protection measures	Avoid, Mitigate	Sponsor	The State Government of Location, as a partner to the project Appropriate measures to be incorporated in the installation's design, Insurance
Safety Regulations	The project not able to meet the environmental/safety regulations	Medium	High	Medium	Use of stringent safety protection measures	Avoid, Mitigate	Sponsor/O&M contractor	Appropriate measures to be incorporated in the installation's design, Insurance
9. Political Risks / other								
Region Stability	Delay in completion, loss of revenue.	High	High	High	Political guarantee	Accept, Mitigate	Sponsor/Insurer	Political insurance to be arranged with MIGA or other agencies. Involvement of DFIs

Terrorism, unrest, war	Delay or stop of completion, loss of revenue or project	Medium	Extreme	Medium	Use of stringent security protection measures, political guarantee	Accept, Mitigate	Sponsor/Insurer	Political insurance to be arranged with MIGA or other agencies.
Theft, vandalism	Delay in completion, loss of revenue.	Medium	Low	Low	Use of stringent security protection measures. Contribution to local economy.	Mitigate	Sponsor/Security contractor	The project will contribute to a local Social Programme. Local people will have vested interest in the project success.
Expropriation, nationalisation	Loss of project	Low	Extreme	Low	Project support agreement with the Government, political guarantee. Contribution to local economy.	Mitigate	Sponsor/Insurer	Political insurance to be arranged with MIGA or other agencies. Involvement of DFIs
Change of law	Delay or stop of completion or operation, loss of revenue or project	High	High	Medium	Strong political and institutional support from the State Government and from the State energy company	Mitigate	Sponsor	Political support agreement with the Government.
Amendment of terms	Loss of revenue.	Medium	High	Medium	Strong political and institutional support from the State Government and from the State energy company	Mitigate	Sponsor	Political support agreement with the Government.
Enforceability of contracts	Loss of contracts, warranties and guarantees	Medium	Medium	Medium	Use of appropriate legal jurisdiction Contribution to local economy.	Mitigate	Sponsor	Political support agreement with the Government.
10. Environmental and Social								
Unacceptable environmental impacts	Protected territory, endangered species, pollution etc.	Medium	Low	Low	Full Environmental and Social Impact Assessment ("ESIA") will be performed as a part of the FS&D process. Use of stringent safety protection measures. Environmental Action Plan agreed and prepared.	Avoid, Mitigate	Developer, Designer/EPC contractor	Stringent environmental procedures to be followed at construction and operations in accordance to agreed Environmental Action Plan

Environmental impact during construction	Pollution to the construction area and surroundings. Destruction of local habitat.	Medium	Low	Low	Full Environmental and Social Impact Assessment ("ESIA") will be performed as a part of the FS&D process. Use of stringent safety protection measures. Environmental Action Plan agreed and prepared.	Avoid, Mitigate	Developer, Designer/EPC contractor	Sponsor will make its best endeavours to select land for the projects that shows no agricultural use and also where no resettlement is required. In the event that the selected land displays such impacts, appropriate mitigation measures will be established.
Environmental impact of transmission lines construction	Visual impact. Disruption of local habitat.	Low	Low	Low	Full Environmental and Social Impact Assessment ("ESIA") will be performed as a part of the FS&D process.	Avoid, Mitigate	Developer, Designer/EPC contractor	The design will follow the best international practice.
Opposition by the local community	Delay in completion, loss of revenue.	High	High	Medium	Social Programme contribution from each project estimated at [] million/yr (yr) which will be further defined in the FS&D.	Avoid, Mitigate	Project Sponsor	The Sponsor will make its best endeavours to select land for the projects that shows no agricultural use and also where little, or no resettlement is required and land owners/users are fairly compensated. Social Programme contribution from each project estimated at [] million/yr (USD /yr) which will be further defined in the FS&D.
11. Sponsor Risk								
Equity and Leverage	Not sufficient equity, high leverage would worsen the DSCR and make the project not attractive to lenders	Low	Very high	Low	The Sponsor to provide sufficient equity and contingent equity	Avoid	Sponsor	Project Sponsor is committed to provide sufficient equity
Shareholders structure	Disputes amongst	High	High	Low	The Sponsor envisages a simple	Avoid	Sponsor	Clear shareholders

	shareholders will make the project not attractive to other financiers				shareholder structure, where initially 100% of the shares are with the Sponsor, with option of other investors to buy in after financial closure.			structure
Willingness to support	Risk of abandonment	High	Very high	Low	The Sponsor is committed to the project and invests development capital and equity	Avoid	Sponsor	Commitment letter issued by Project Sponsor
Corporate governance	Results in inefficient management, PR and compliance issues	High	High	Low	The Sponsor and the operating company are guided by Project Sponsor's corporate governance principles	Avoid	Sponsor	Corporate structure and governance to be presented and approved by the lenders
Project management	Inefficient management, delays and losses	High	High	Low	The project will be managed by professional managers with proven track record and under best management practices	Mitigate	Sponsor, O&M contractor	Management procedures, O&M guarantees

1.10 Introduction to Securities and Guarantees³

In a project financing, lenders require the sponsors or other creditworthy parties involved with the project to provide assurances, generally through contractual obligations, that:

- the project will be completed, even if the costs exceed those originally projected (or, if the project is not completed, its debt will be repaid in full);
- the project, when completed, will generate cash sufficient to meet all of its debt service obligations; and
- if for any reason, including force majeure, the project's obligations are interrupted suspended or terminated, the project will continue to service (and fully repay on schedule) its debt obligations.

There are several types of security arrangements, or combinations of them, which the lender may require for a specific project, depending on its nature and associated risks.

1.11 Security interest in project facilities or other tangible assets

It is common the banks to take security over the project assets, if this is possible under the laws of the country where the assets are situated.

In cases where this is inappropriate or impossible the lenders will have to rely on negative pledges - binding commitments on the part of the borrower not to create encumbrances over its assets in favour of any third party.

In some cases the bank can use the value of specific tangible assets, which can be separated from the project, to supplement its security. The value of such assets is evaluated on the basis of their open market price. Such tangible assets usually include:

- the tangible assets used in the facilities - equipment, machinery, plants and other physically movable assets;
- the land, buildings and other properties of the project company;
- technology and process licenses;
- the operating permits and licenses;
- rights under contractor's performance bonds or completion guarantees (see below);
- the goods produced by the project, the sales and the project's bank accounts; and
- other rights - energy or goods supply contracts, operating agreements, joint venture agreements, transportation contracts etc.

1.12 Security arrangements covering completion

Such securities typically involve an obligation to bring the project to completion, or else repay all project debt. The banks usually require that the sponsors or other creditworthy parties provide an unconditional undertaking to furnish any funds needed to complete the project in accordance with the design specifications and place it into service by a specified date.

On other hand, the project sponsors have to secure the performance of contractors, sub-contractors and suppliers by requiring bonding from banks or surety companies. The bonds usually are unconditional on-demand payment obligations in favour of the project company in a form of a bond, guarantee or standby letter of credit. The most frequently used types of bonds include

³ The source for the ideas on project securities and guarantees were borrowed from John Finnerty "Project Financing" publisher John Wiley (1996) and Clifford Chance "Project Finance" publisher ISR,(1991 reprinted 1994).

tender bonds - commitment to take on the contract; performance bonds - performance guarantee by the contractor; advance payment guarantees - a guarantee to refund an advance payment in the event of failure to perform; retention money guarantees - retention of money to cover rectification of defects; and maintenance bonds - to cover defects discovered after completion of construction.

1.13 Security arrangements covering debt service

After the project commences operation, contracts for the purchase and sale of the project's outputs normally constitute the principal security arrangements for the project debt. Lenders always require that these contractual obligations are in place, valid and binding (with the required governmental and regulatory approval) before any portion of their loans can be drawn down.

The banks normally need assurances that the debt can be fully serviced out of project revenues received from binding purchase and sales contracts. The main types of such contracts are: Take-if-Offered contract, Take-or-Pay contract, Supply-or-Pay contract, Hell-or-High-Water contract, Throughput Agreement, Cost-of-Service contract and Tolling Agreement.

The contracts for power supply and purchase represent a type of purchasing agreement, which can be used as a security for covering debt service.

1.14 Supplemental credit support

The bank may want to have additional security arrangements in event the purchase and sales contracts fail to provide enough cash to enable the project company to service its debt obligations. Examples of such agreements are: financial support agreement (usually letter of credit); cash deficiency agreement; capital subscription agreement; clawback agreement (control over the project's dividends and/or tax benefits) and escrow fund (special deposit account). These agreements provide commitment from creditworthy party(ies) to supplement any cash deficiency in servicing the project's debt obligations.

1.15 Insurance

The bank will require an adequate insurance policy, providing that the project will be restored as a viable operating or commercial entity, as a result of accident, force majeure or contractual failure. In some cases the bank may require an insurance against business interruption.

1.16 Governmental support and guarantees

For projects critical to the national security, infrastructure or where the project company is majority state owned, the bank will require governmental guarantee. The governmental guarantee may provide a supplemental credit support against the political risk, or the government may act as a principal borrower.

In many cases the lender will seek assurances from the national and/or local government that they will not take actions or impose policies that may adversely affect the project. Such policies include tariff setting, tax, duty and excise etc. Depending on the project and the type of security required by the lender, the governmental support may be provided in a form of letter of support, support agreement or loan agreement. Such governmental commitments usually require some form of approval or ratification from the local or country parliament.

2 Financial Economics of Energy Made Easy

Objective: to explain various methods for calculating project costs and financial and investment appraisal.

Introduction

In this chapter we shall define various methods for calculating energy costs and energy revenues and a few basic investment appraisal techniques. The purpose of this chapter is to inform the reader of how energy costs and benefits are calculated and why.

Each method has certain advantages and disadvantages. Whilst all banks prefer to use a discounted cash flow model, it is unlikely that many companies follow this practice in their energy revenue computations. They are likely to use simple payback methods to calculate the costs and benefits of energy projects. It is crucially important therefore that the proposer understands how to do the discounted type of financial calculations since they are fundamental to the financial projections which are required under a business plan. A good understanding of these various methods--how they work, their purpose, limitations and applications--will enable the proposer to set out financial projections and financial plans which meet the minimum professional standards required by most financial institutions.

We will discuss the financial economics of energy first in terms of a simplified model on how to calculate costs. We will then turn to the principles underlying financial assessment and investment appraisal. The key point is that the use of undiscounted methods for calculating the return on energy investment are not appropriate and therefore, discounted methods should be used. Let us now turn to calculating costs of the project.

The first step in assessing the financial viability of an energy efficiency proposal is to determine the costs related to energy usage. The various types of costs related to energy usage and the calculation of the economic value of energy are:

- * **Capital Costs of the Project.** This is the initial investment in the project.
- * **Fuel Costs.** This includes gas, oil and electricity.
- * **Operating Costs.** Amongst the major items to consider are:
 - * Maintenance
 - * Materials
 - * Labour
 - * Service utilities
 - * Storage
 - * Handling
 - * Other items which are expended within one year.

For a listing of the types of project costs which a bank may require, see **Section 6** of the Business Plan Form in **Chapter 7**. The costs of the project could include: land, building and facilities, equipment and machinery, installation, start-up expenses, training, professional fees, working capital, interest during construction, registering security and insurance policies. These costs should be split according to foreign currency, local currency and contributions in-kind. A detailed worksheet for these costs is found in **Chapter 7** with notes found in **Chapter 8**. In this section we shall discuss the principles of capital costs.

2.1 Capital Costs of the Project and Depreciation

Energy projects usually require an initial investment for land/new equipment to achieve results. Capital costs can be viewed as the investment from which long term benefits are expected. The capital costs, more specifically, comprise goods, plant and machinery, which are bought and paid for up-front (during the implementation period) and reside in the business for subsequent years with the view that such items will make a positive contribution for several years in the future. Other important asset, depending on the project, is land – owned, leased or rented.

The capital costs of the project (usually, not applicable to land) will be accounted as an asset and depreciated over the subsequent years. Depreciation can be defined as (1) the reduction in the book or market value of an asset (accounting depreciation) or (2) the portion of an investment that can be deducted from taxable income (taxable depreciation).

Depreciation is a non-cash expense: it only reduces taxable income and provides an annual tax advantage (or tax shield) equal to the product of depreciation and the (marginal) tax rate but it does not lead to a cash outflow from the company.

The most common method for depreciation is straight-line depreciation. Under this method, annual depreciation equals a constant proportion of the initial investment. Other methods of depreciation exist. For example, to benefit sooner from the tax advantages offered by depreciation, one can apply accelerated depreciation, an accelerated cost recovery system where the amount depreciated is larger in early years than the later years.

The company may decide to sell the equipment or machinery after using it for a number of years: this amount is the investment's salvage value. The value of the equipment or machinery will be depreciated by a certain percentage per year until its ultimate salvage value is reached. The salvage value of the equipment is related to its initial capital cost.

Example 4.1

Fan blades to a turbine at a power plant are in need of repairs or replacement. After four years of use, they show corrosion and with replacement with new blades a seven to ten per cent increase in efficiency can be achieved. The initial cost of the installed blades is USD 500,000. Calculate the salvage value of the blades if:

- (1) The depreciation is set at USD 75,000 per year;
- (2) The depreciation is set at the rate of 20% reduction in value per year.

Solution

- (1) After four years, the total depreciation is:
 $4 \text{ years} \times \text{USD } 75,000/\text{year} = \text{USD } 300,000.$

The salvage value is given by:

$$\begin{aligned} & \text{Initial value - depreciation} \\ & = \text{USD } 500,000 - \text{USD } 300,000 \\ & = \text{USD } 200,000. \end{aligned}$$

In this case, if we assume that the corporate tax rate is 40%, the annual tax shield will amount to:

$$\begin{aligned} \text{Tax shield} & = \text{depreciation} \times \text{tax rate} \\ & = \text{USD } 75,000 \times 40\% \\ & = \text{USD } 30,000. \end{aligned}$$

(2) In tabular form, the salvage value may be calculated as follows:

Table 4.1: Depreciation Table (amounts in US Dollars)			
Year	Value at Start of Year	20% Depreciation	Residual Value
1	500,000	100,000	400,000
2	400,000	80,000	320,000
3	320,000	64,000	256,000
4	256,000	51,200	204,800

In this particular example, the salvage value is therefore USD 204,800. One should note that as depreciation is greater in the first years, the company will benefit from the tax shields sooner and these will be worth more (see below at paragraph 2.3.1 Time value of Money).

2.2 Operating Costs

There are many other costs which are part of the operational costs of a project. In terms of manufacturing costs, there are direct costs due to raw materials, labour, energy costs other than fuels and maintenance.

Indirect costs such as storage, rates and rent, insurance and handling also apply. There are also general overhead costs due to administration and distribution activities. These are not considered in any detail here as they rarely affect the major costings of energy projects.

2.2.1 Energy Costs

The main aim of the initial capital investment will be to produce energy, fuel and/or other products (like heat) or generally, other money generating activities or products for the company. Monetary revenues will be achieved either by (1) installing a new technology or new equipment/machinery that

produces energy; (2) or equipment that generates energy/fuels from raw materials; and/or (3) fuel switching in order to benefit from another type of fuel, or (4) capital investments in technologies and activities that generate new/additional money streams for the project, like heat production, or to capture Carbon, other measures, which allow for Carbon offsetting (to be sold to airlines and shipping companies) and similar. .

The economic value of the energy projects is related to how quickly the produced energy/fuel can cover the initial capital costs of the project.

Energy/Fuel costs are crucial in the calculation of the running costs of projects and the determination of whether the proposed project is viable. The prices (tariffs) of electricity and fuels are important aspects of energy economics. However, the future value of the cost of a fuel is difficult to state with certainty for a number of reasons, some of the more common being:

* **Negotiability of Price by Large Buyers**

The large users and power generators as market maker consumers of particular fuels are able to negotiate local prices for fuel which may be different from these on the international markets.

* **Methods of Extraction Change Fuel Prices**

The method of extraction changes the prices of fuels and this is especially true for different fuels. Open-cast coal for example generally costs less than deep-mined coal.

* **Market Demand Alters Fuel Prices**

Market forces can play havoc on long-term forecasts. Witness the oil price shocks in the 1970s and then the considerable fall in fuel oil prices in the late 2020s. And there are complex knock-on effects on the prices of natural/shale gas and the viability of renewable energy projects.

The prices (tariffs) of fuels are a crucial aspect of energy projects since they are the input factors which have the largest impact on the overall profitability of the operations. Fuel prices are a major factor in calculating the revenues of different kinds of schemes and in assessing the viability of proposed projects. To illustrate these concepts, consider the following example.

Example 4.2

The industrial company Rollon plc uses 10,000 MWh of electricity (5 pence per kWh) and 400,000 therms of gas (36 pence per therm) per year for its power and heating requirements. The company has traditionally purchased the electricity and used a gas-fired boiler to generate the heat. The management of Rollon is now considering whether to install a diesel engine to generate both the power and the heat. It is estimated that the diesel engine will consume 2 million litres of fuel oil per year (11 pence per litre). Calculate the fuel costs of the two systems.

Solution

Present System: Annual Costs

Electricity cost = number of kWh x (cost/kWh)

$$= (10,000 \times 1000) \times 0.05 = \text{£ } 0.5 \text{ million}$$

Gas cost = number of therms x (cost/therm)
= 400,000 x 0.36 = £ 0.144 million

Therefore, the total fuel cost = **£ 0.644 million**

Diesel Engine Scheme: Annual Cost

Fuel oil cost = number of litres x (cost/litre)
= $2 \times 10^6 \times 0.11 = \text{£ } 0.22 \text{ million}$

Therefore, the total savings in fuel cost

= £(0.644 - 0.22) million
= **£ 0.424 million**

Comment

The above figures indicate that the project would save a great deal of money on energy costs. However, many other costs including the capital costs of the engine and operating costs have not been included. The usefulness of this calculation is that it helps a company make a preliminary evaluation of new schemes and the savings in fuel costs will subsequently be compared to the initial investment required. A detailed analysis of what types of costs should be considered are found in Section 6 of the Business Plan Form in Chapter 7.

2.2.2 Relating Costs to Production: Fixed versus Variable Costs

The traditional method in classifying costs is to distinguish between **fixed** costs and **variable** costs. **Fixed costs** do not change with the output of the plant. These include:

- * Rent
- * Rates
- * Insurance
- * Space heating and lighting
- * Offices and administration
- * Interest on capital invested, such as interest charges on plant

Variable costs are those which vary directly with the output of the plant. These include:

- * Raw materials
- * Process energy
- * Electricity and fuels
- * Maintenance
- * Packaging

* Labour costs

The total costs of operating a project is the sum of the fixed and variable costs. The total costs can be worked out by first adding up the fixed cost items, which can be obtained from the financial records, and then adding the costs of variable items for any level of production.

$$\text{Total Costs} = \text{Fixed Costs} + \text{Variable Costs}$$

Individual cost items such as energy have both fixed and variable components. In many industrial processes, **energy is consumed even at zero output** through, for example, the standing losses of the furnace or boiler. The variable energy consumed for each additional unit of output must then be added to this baseline figure.

Since the total cost of operating a energy project will be the sum of fixed and variable costs, the total will vary with the output of the plant. It is possible in some cases, therefore, to make a comparison of two raw material supply schemes by calculating how the total costs vary with the level of supply.

Having examined the basic principles of how to calculate energy costs, let us now turn to the principles of investment in new energy projects.

2.3 Introduction to Investment Appraisal

Investment appraisal is the process whereby a range of projects are evaluated and ranked according to measures of financial return. These measures allow a company and its investors and lenders to use a common set of values to make financial comparisons between different projects. A company should first think about what projects to accept and second about how they should be financed (separation of investment decisions from financing decisions is one of the most important basic principle of modern corporate finance). In general, we are faced with either corporate finance (which means financing a project of an existing company) or project finance (which involves setting up a new company).

Some of the major objectives of investment appraisal are:

- * To determine which investments make the best use of the organisation's money
- * To ensure optimum benefits from each of these investments
- * To minimise risk to the enterprise; and
- * To provide a basis for the subsequent analysis of the performance of each investment.

The appraisal process produces measurements of the financial contribution each project is expected to make to the business, identifies the risks and uncertainties in each project, and defines the expected costs and benefits. The decision-maker uses the results of the appraisal to select the "best" project. Other strategic factors that need to be taken into account are:

- * Quality of management
- * Cost structure of the business
- * How the project relates to the core objectives of the business
- * The relation of the project to the company's objectives in terms of capacity, quality, flexibility, product mix, logistics and so on.

Let us emphasize that investment appraisal does not determine whether or not a project should be approved. The main function of the appraisal process is that it allows for different people with different self-interests to agree on a ranking of a whole range of possible projects open to the company.

Whilst there are many different possible ways to evaluate a project, we shall first focus on a few basic concepts and gradually build up to a moderately useful if not sophisticated model for assessment. Our aim is to sin on the side of usefulness rather than sophistication. The field of financial appraisal is underpinned by concepts in modern finance theory. However, in this discussion we will not even attempt to review any of the history of modern corporate finance theory and except on occasion where unavoidable to make references to such theory.

2.4 Cash Flows

The first step in any investment appraisal is to gather the appropriate information on the project costs and benefits and calculate the cash flow generated by that project.

In the simplest terms, the cash flow is the difference between the money coming in and the money going out of the investment project.

Cash-flows are not to be confused with accounting profits and losses, which include some cash flows and exclude some others. Or, preparing a cash flow model is quite often based on existing accounting data (income statement and balance sheet statement). The usual construction of a financial model starts from the income statement, from which cash flow statement will be derived, from which the end-of-year balance sheet will be constructed. As a consequence, some careful corrections will have to be made to transform the accounting earnings generated by the investment project (income statement) into the cash-flows generated by the project. For example, depreciation charges have to be added as they do not correspond to a cash outflow at all, increase in account receivables and inventories which do not correspond to cash-inflows will have to be deducted and increases in account payables which do not correspond to cash out-flows will have to be added.

One should thus remember that cashflow statements can be derived from accounting figures, mainly the profit and loss (income) statement and balance sheet which contain all the necessary information. For details of how cashflow statements are constructed and are related to income statements and balance sheets, please see Commentary to **Section 11** of the Business Plan Form.

Example 4.3:

Suppose a project costs USD 100,000 which produces an annual revenues of USD 20,000 for six years. The cash flow is:

Table 4.2: Simplified Cash Flow	
Year	Cash Flow
0	(100,000)*
1	20,000
2	20,000
3	20,000
4	20,000
5	20,000
6	20,000
Total Net Cash Flow	20,000**

Figures stated in parenthesis follow the standard accounting practice of being an outflow or a negative amount. The USD 100,000 is the capital cost.

** Total Cash Flow is USD 20,000 per year x 6 years = USD 120,000. The capital cost was USD 100,000. Therefore the total Net Cash Flow is USD 120,000 - USD 100,000 = USD 20,000.

This is a very simplified example of cash flow. There is no reason to expect the revenues to be the same in each year.

Cash flows have to be evaluated on an incremental basis: the value of a project depends on all the additional cash flows that follow from project acceptance. In estimating the cash flows generated by a project, one should pay particular attention to the following points:

(1) Marginal not average cash flows: one should tirelessly track down all cash flow consequences of investment decisions. Incremental Net Present Value (see below) in a loss-making division can be strongly positive and vice-versa.

(2) Forget sunk costs: these are costs which have been incurred in the past and cannot be reversed. They are past and irreversible outflows. Because sunk costs are by-gones, they cannot be affected by the decision to accept or reject a project, and so they should be ignored.

(3) Include opportunity costs: the cost of a resource may be relevant to the investment decision even when no cash changes hands. The proper comparison between investment projects is not "before versus after" but rather "with or without".

2.5 Payback

The payback of a project is easy to calculate. It is defined as the length of time required for the running total of net revenues before depreciation to equal the capital cost of the project or, even more simply, it is the capital cost divided by the average annual revenues. The basic idea is that the shorter the payback time the more attractive the investment.

$$\text{Payback} = \text{Capital Cost} / \text{Annual Revenues.}$$

The advantages of payback as a financial measure are:

- * It is easy to calculate
- * It is interpreted in tangible terms, i.e., years
- * It does not require any assumptions about the project in terms of timing, lifetime or interest rates.
- * It favours projects with a short payback time, which reduces the uncertainty of calculating revenues for periods a long time in the future. The effects of changing technology and fuel prices are reduced.
- * It does take into account in a crude fashion the timing of the net revenues.

The disadvantages to payback are:

- * It takes no account of any cash flows after the payback period (cut-off date) and therefore does not assess the overall value of the project. If the company uses the same cut-off regardless of project life, it will tend to accept too many short-lived projects and too few long-lived ones.
- * It does not indicate a rate of return on the money invested.
- * It takes no account of the residual value in the capital asset.
- * It takes no account of the time value of money.

To illustrate the above points, let us examine the following example consisting of three different project opportunities.

Example 4.4

Calculate the payback times of each of the three projects given that the capital outlay (initial capital investment) is as described:

Table 4.3: Comparing Schedule of Costs of Three Projects						
	Project 1		Project 2		Project 3	
Capital Costs	50,000		50,000		50,000	
	Net annual revenues	Running Total	Net annual revenues	Running Total	Net Annual revenues	Running Total
Year						
0	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)
1	10,000	(40,000)	25,000	(25,000)	8,000	(42,000)
2	10,000	(30,000)	25,000	0	9,000	(33,000)
3	10,000	(20,000)	25,000	25,000	10,000	(23,000)
4	10,000	(10,000)	25,000	50,000	23,000	0
5	10,000	0	25,000	75,000	9,000	9,000

Solution

The payback period for each of the three projects are:

Project 1: 5 years.

Project 2: 2 years.

Project 3: 4 years.

The payback method does take into account the timing of the net revenues but notice that interchanging revenues generated in years 2 and 4 for Project 3 makes no difference to the final outcome. We will see later that an explicit recognition of the timing must be taken into account. The above example however does illustrate the basic virtues and disadvantages of the payback method. The table below summarizes the advantages and disadvantages of the payback method.

Table 4.4: Payback Method - Summary of Advantages and Disadvantages	
Advantages	Disadvantages
<p>1 The method favours projects with short payback periods, thus reducing uncertainty associated of calculating revenues over the long term in the future.</p>	<p>1 The payback method does not consider revenues produced after the payback time and therefore fails to assess the overall value of the project.</p>
<p>2 Favouring the shortened period means that effects such as changing technology and fuel prices are reduced.</p>	<p>2 The payback method does not indicate a rate of return on the money invested.</p>
	<p>3 The payback method may give a misleading picture of the timing of net revenues as in the above example under Project 3, years with different payouts could be interchanged without any difference to the payback result.</p>

As we can see, payback is a method which can give us some useful answers but it falls short whenever it is used for longer-term projects where fluctuating prices and interest rates may need to be featured in the calculations. Later we shall see that the simple payback method is inversely related to the discounted rate of return. That is, the shorter the payback period, the higher the rate of return.

The fact that payback ignores the timing of net revenues is a big flaw and therefore, it is suggested that it is used as only a very preliminary rough indicator and preparatory to using a more detailed discounted technique of analysis.

The simplicity of payback makes it an easy device for describing investment projects, but it should by no means govern the investment decisions of the managers.

We turn now to discounted methods of appraisal and examine the principles underlying the method of discounted cash flow.

2.6 Discounted Cash Flow Methods (DCF)

2.6.1 Time Value of Money: Interest Rate

In order to calculate the value of a project over a number of years, one needs to take into account **the time value of money**.

It is a basic principle of finance that money has time value. This means that a certain amount of money in hand today (that is, cash) is always worth more than an equivalent amount of money a year from now. The reason for charging interest on a loan is related to this concept of time value. In other

words, the bank should be able to charge a market related price for the use of its money. The main charge for the use of the bank's money is called **interest**, which is stated as an annual percentage rate.

Whilst the payback method of appraisal is easy to use, it fails to allow sufficiently for the timing of revenues. A project which generates higher revenues in the early years facilitates further investment in other schemes. DCF methods if properly applied puts weight to the value of revenues at certain times and thus, **takes into account the timing of investments**.

Basically, DCF methods are based on interest rates. For example, a deposit of EURO 100 in a bank at 10% will accrue EURO 10 of interest in the first year and the account will be worth EURO 110 at the end of year 1. A different way of looking at these figures is to say that an interest rate of 10%, a figure of EURO 110 in one year's time is worth EURO 100 now--the EURO 100 is its present value. We could also say that to get EURO 110 in one year, we would have to deposit EURO 100 in the bank today.

By repeating this process, if the EURO 110 is left in the bank to accrue another year of 10% interest, the account would be worth EURO 121 at the end of year 2. Again, it could be said that at an interest rate of 10%, an amount of EURO 121 over a two year period has a present value of EURO 100. The general formula for this concept is:

$$S = D \times (1 + i)^N$$

Where i = interest rate, in %

D = Deposit

S = Value of money saved.

The Present Value (PV) of an amount of money S saved in year N will be:

$$PV = S/(1 + i)^N.$$

Example 4.5

A project generates cash flows of EURO 20,000 in years 2 and 4 of its operation. Calculate the present value of the revenues for an interest rate of 12%.

Solution

Using the formula for Present Value:

$$PV = S/(1 + i)^N$$

We have for year 2:

$$\begin{aligned} PV &= \text{EURO } 20,000/(1 + 0.12)^2 \\ &= \text{EURO } 15,943.88 \end{aligned}$$

For year 4:

$$\begin{aligned} &= \text{EURO } 20,000/(1 + 0.12)^4 \\ &= \text{EURO } 12,710.36. \end{aligned}$$

If we extend this concept to a complete project which generates revenues over a sequence of years then for each year there will be a factor $1/(1 + \text{interest rate})^N$ which relates the revenues at year N to a present value. This factor is called a **discount factor** (see Table below on Discount Factors) and its effect is to reduce the value of revenues achieved in the later years of project life. The Table below gives discount factors for various interest rates (or discount rates) for a 10 year range.

Table 4.5: Discount Factors								
Year	Interest Rates (or Discount Rates)							
	8%	10%	12%	14%	16%	18%	20%	24%
0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1	0.926	0.909	0.893	0.877	0.862	0.848	0.833	0.810
2	0.857	0.826	0.797	0.769	0.743	0.718	0.694	0.651
3	0.794	0.751	0.712	0.675	0.641	0.609	0.579	0.525
4	0.735	0.683	0.636	0.592	0.552	0.516	0.482	0.423
5	0.681	0.621	0.567	0.519	0.476	0.437	0.402	0.341
6	0.630	0.564	0.507	0.456	0.410	0.370	0.335	0.275
7	0.584	0.513	0.452	0.399	0.354	0.314	0.279	0.222
8	0.540	0.467	0.404	0.351	0.305	0.266	0.233	0.179
9	0.500	0.424	0.361	0.308	0.263	0.226	0.194	0.144
10	0.463	0.386	0.322	0.270	0.227	0.191	0.162	0.116

It is important to remember that year 0 is the current time and therefore will always have a discount factor of 1. The basic concept of discounting cash flows of future years to a present value is the basis for the project appraisal technique called **Net Present Value** method. This method overcomes the disadvantages associated with the undiscounted and payback methods.

2.6.2 Net Present Value Method (NPV)

The NPV method is simply a method for calculating the present value of all yearly capital costs and net revenues throughout the life of a project. By summing all the present values (costs are represented as negative amounts and net revenues as positive), a total will be obtained which is called the NPV of the project.

The basics of the NPV criteria are the following:

1. Forecasting all cash flows generated by the investment projects;
2. Discounting these cash-flows with the appropriate opportunity cost of capital.

To calculate the present value of an investment project, we discount the expected future cash flows by the rate of return offered by comparable investment alternatives. This rate of return is often referred to as the **discount rate**, hurdle rate or **opportunity cost of capital** - it is the return forgone by investing in the project rather than investing in securities.

If we invest in a riskless project, we will discount the forecasted cash flows with the risk-free rate of return (the interest rate offered by the bank on Treasury Bills for example). But if we invest in a risky project, we will have to include a risk premium to the discount rate. This is so because the bigger the risk involved in a project, the bigger the return expected by the investor. The uncertainties in estimating the net savings of the project are offset by using a slightly pessimistic (high) discount rate. When preparing the investment appraisal of a project, it is advised that the sponsor (i) justifies clearly his choice of discount rate and (ii) conducts a sensitivity analysis in order to see the impact of the discount rate on the net present value of his project. It has to be noted that the discounting is applicable only to the investments made, but not to loans or other repayable financial instruments.

It is important to emphasize that each investment project should be evaluated at its own opportunity cost of capital. It would be clearly unreasonable to suggest that a company should demand the same rate of return that applies to the company as a whole (and thus reflects the risk of the company as a whole) for a very safe project as for a very risky one. This would lead the company to reject good low-risk projects and accept poor high-risk projects.

If the NPV is negative, it means that the present value of the net revenues (cash in-flows) generated by the project during its life-time are less than the initial capital costs (initial cash out-flow). The project should then be rejected (after sensitivity analysis at different discount rates).

If the NPV is positive then it is not automatically accepted, but other factors are taken into account to assess the worthiness and value of the project. These other factors will be discussed later in the chapter.

2.6.3 *Treating Inflation Consistently*

Discounting is designed to take account of the time value of money and thus is a basically a forecast. The discount rate should not be confused with the general rate of inflation which is not selected but is given as a fact. This includes fuel prices, wages and maintenance costs, equipment costs and installation costs. In the U.K., as in other countries, the rate of inflation is formally associated with the Retail Price Index (RPI) which is published monthly by the central government.

Inflation can be seen when the value of money decreases over time. For example, when prices of goods are rising by 10% a year and the money rate of interest is 15% then the real money rate of interest is 5% - the difference between the money market rate (the nominal rate) and the inflation rate. In effect, the real rate of interest is the rate of interest that would be paid if prices were constant.

The object of expressing something in real terms is to adjust for the effect of rising prices throughout an economic system. To differentiate between actual money and money with constant purchasing power, economists refer to the latter as money in real terms. When the annual rate of inflation is 10% the real purchasing power of EURO 110 received in one year's time is EURO 100. This is equivalent to another form of discounting which must be clearly differentiated from the effect of time value of money. In other words, the inflation rate can influence our decision on what type of discount rates are appropriate.

There is no absolutely objective method for taking account the effects of inflation when discounting the money value of the net revenues. In general, many financial practitioners use the RPI as the

"discount factor for inflation" and forecast that this inflation rate will prevail during the life-time of the project.

The important message to remember is to apply a consistent treatment of inflation in your calculations.

If the discount rate (risk-free interest rate plus risk premium reflecting the risk of the project envisaged) is stated in nominal terms then consistency requires that forecasted cash flows be estimated in nominal terms, taking account trends in selling price, labour and material costs etc. Of course, there is nothing wrong with discounting real cash flows at a real discount rate.

	CASH FLOWS	
DISCOUNT RATE	NOMINAL	REAL
NOMINAL	YES	NO
REAL	NO	YES

Discounting nominal cash flows (taking into account the effect of inflation and price variation) with a nominal discount rate will always yield the same results as discounting real cash flows with a real discount rate. The following example shows how this is true.

Example 4.6

A company plans to invest EURO 50,000 in an energy project with a lifetime of four years. It is estimated that the revenues and costs of the project will be as follows:

Energy revenues= EURO 50,000 in the first year escalating by 5% per year

Labour costs = EURO 20,000 in the first year escalating by 8% per year

Materials and Other

Costs = EURO 10,000 in the first year escalating by 10% per year.

Assume the inflation rate (Retail Price Index) is currently 7% and the nominal rate of interest is 15%. Assume also that the project envisaged is risk-free. Calculate the present value of the project in nominal and real terms.

Solution

You will first need to evaluate the net revenues of the project by subtracting the costs from the energy revenues, allowing for the escalation in value of revenues and costs.

Year	Capital Costs (EURO) (A)	Energy Revenues (5%/yr) (EURO) (B)	Labour Costs (8%/yr)(EURO) (C)	Material and Other Costs (10%/yr) (EURO) (D)	Actual money Value of Revenues (EURO) (E)
0	-50,000	None	None	None	-50,000
1	none	50,000	-20,000	-10,000	20,000
2	none	52,500	-21,600	-11,000	19,900
3	none	55,125	-23,328	-12,100	19,697

4	none	57,881	-25,194	-13,310	19,377
---	------	--------	---------	---------	--------

Columns A through E represent the following:

- A EURO -50,000: this is the initial capital investment of the project.
- B Energy revenues: with escalation factor of 1.05.
- C Labour costs: the escalation factor is 1.08.
- D Material and other costs: escalation factor is 1.10.
- E Actual money and value of revenues = net revenues = (A + B + C + D)

This example shows clearly that the value used as the inflation rate is an average value and that energy, labour and other costs can escalate at a speed rate different than inflation.

Method 1: NPV Analysis in Nominal (Money) Terms

This method works by discounting the actual values of the net revenues with a discount factor which is based on a discount rate which includes an allowance for inflation. In this case the discount rate R is the combined effect of the real discount rate I_R , and the overall inflation rate (Retail Price Index). Banks tend to favour calculations in nominal terms.

The nominal discount rate R is the combined effect of the real discount rate I_R and the overall rate of inflation as measured by the inflation rate⁴. In this case, we have agreed that the discount rate is 15% (no risk premium).

The NPV is calculated as follows:

Year	Capital (EURO) (A)	Net Revenues (money terms) (EURO) (B)	Discount Factor (15%) (C)	Present Value (money terms) (EURO) (D)
0	-50,000	-50,000	1.000	-50,000
1	none	20,000	0.870	17,391
2	none	19,900	0.756	15,047
3	none	19,697	0.658	12,951
4	none	19,377	0.572	11,079
			Total	56,469
			NPV	6,469

⁴ To calculate the nominal discount rate, we use the following relationship:

$$\begin{aligned}
 (1 + R) &= (1 + I_R)(1 + RPI) \\
 &= (1 + 0.08)(1 + 0.07) = 1.1556 \\
 \text{i.e. } R &= 0.1556 \text{ or } (15.56\%).
 \end{aligned}$$

For purposes of simplification, we will round the value of R to 15%.

The columns A to D represent the following:

A EURO -50,000 is the initial capital investment.

B Column B is from Column B of the previous table.

C Discount factor.

D $D = C \times A$; or $D = C \times B$.

Method 2: NPV Analysis in Real Terms

You can also calculate the real values of the net revenues using a discount factor which is based on the real discount rate.

The columns A through F represent:

A EURO -50,000 equals the initial capital investment.

B This is the same as column E from Table 4.6.

C The factor = $1/(1 + \text{inflation rate})^N$, where inflation rate = 0.07.

D This is an application of the equation for computing the real value of a sum of money:

$$\text{real value} = S/(1 + \text{RPI})^N.$$

In this case, $D = C \times A$ or $D = C \times B$.

E The factor = $1/(1 + \text{real interest rate})^N$, where the real discount rate = 0.08.

The real discount rate is calculated according to the following formula:

$$(1 + \text{nominal discount rate}) = (1 + \text{real discount rate}) \times (1 + \text{inflation rate})$$

$$(1 + 15\%) = (1 + 7.4766\%) \times (1 + 7\%).$$

F This is the present value in real terms. Notice that the net present value in real terms is 6,469, which is the same as the one calculated above in nominal terms. In theory, they should be precisely the same - their small difference is due to rounding off estimations in the calculations.

Even if the results under the two methods are the same, we encourage you to always use nominal cash-flows and nominal discount rate.

The following example sets out the capital costs and net revenues of three projects. For a nominal discount rate of 14%, calculate the NPV of each project.

Year	Capital (EURO) (A)	Net Revenues (money) (B)	Inflation Deflator (EURO) (C)	Net Revenues (real terms) (EURO) (D) = B x C	Discount Factor (real terms, 7.4766%) (E)	Present Value (real terms) (F) = D x E
0	-50,000	None	1.000	-50,000	1	-50,000
1	none	20,000	0.935	18,692	0.930	17,391
2	none	19,900	0.873	17,381	0.866	15,047
3	none	19,697	0.816	16,079	0.805	12,951

4		19,377	0.763	14,783	0.749	11,079
					Total Revenues =	56,469
					NPV =	6,469

Example 4.7

Consider three projects with initial capital costs of EURO 120,000, EURO 120,000 and EURO 160,000 respectively. The net annual revenues are stated in the table below. Given a discount rate of 14%, calculate the NPVs for each of the projects.

	Project 1	Project 2	Project 3
Capital Cost (EURO)	120,000	120,000	160,000
Year	Net annual Revenues	Net annual Revenues	Net annual Revenues
1	32,000	36,000	35,000
2	32,000	34,000	37,000
3	32,000	32,000	40,000
4	32,000	30,000	45,000
5	32,000	28,000	48,000
6	32,000	26,000	50,000

Solution

The discount factors for a rate of 14% are taken from Table 4.5 above. The columns of present values in the table below are obtained by multiplying the net saving by the appropriate discount factor. The NPV is obtained by subtracting the capital cost from the sum of the discounted net revenues.

Year	Discount Factor for 14%	Project 1		Project 2		Project 3	
		Net Revenues (EURO)	PV (EURO)	Net Revenues (EURO)	PV (EURO)	Net Revenues (EURO)	PV (EURO)
	(A)	(B)	(A x B)	(C)	(A x C)	(D)	(A x D)
0	1.000	-120,000	-120,000	-120,000	-120,000	-160,000	-160,000
1	0.877	32,000	28,070	36,000	31,579	35,000	30,702
2	0.769	32,000	24,623	34,000	26,162	37,000	28,470
3	0.675	32,000	21,599	32,000	21,599	40,000	26,999
4	0.592	32,000	18,947	30,000	17,762	45,000	26,644
5	0.519	32,000	16,620	28,000	14,542	48,000	24,930
6	0.456	32,000	14,579	26,000	11,845	50,000	22,779
Gross PV =		124,437		123,490		160,524	
NPV =		4,437		3,490		524	

The projects can be ranked in the following order:

Project 1: NPV = +4,437

Project 2: NPV = +3,490

Project 3: NPV = +524.

Project 1 has the highest NPV and would therefore be the one selected amongst the three proposed schemes.

The NPV of a project should be positive for the project to be accepted. The magnitude of the NPV represents the extra money made available by the project. For example with Project 2, the NPV of EURO 3,490 could be regarded as money which is available now if the 3,490 is borrowed against the project surplus. In this sense the NPV is immediately available.

2.6.4 *Internal Rate of Return (IRR) Method*

The Internal Rate of Return (IRR) is defined as the discount rate which will make the NPV of a project equal to zero. It is a handy measure and widely used in finance.

This represents the rate (including risk premium) that money would have to earn outside or elsewhere in the organisation to be a better investment. The higher the IRR on a project, the better the project.

The IRR rule states that companies should accept any investment offering an IRR in excess of the opportunity cost of capital. This technique is based on discounted cash flows and will give a correct answer if properly used.

There is no easy and direct way of calculating IRR (except by successive approximations or by using a computer programmed to do these approximations on an automatic basis). We shall show how to derive the IRR using a graphical means.

The calculation method is identical to that of the NPV method described by systematically repeating the calculation with different discount rates until the NPV is zero. The graphical method requires less calculation and is illustrated by the example below.

Example 4.8:

Using the cash flow data of Project 2 in Example 4.7, calculate the NPV for discount rates of 10%, 14% and 16%. Draw the graph of the NPV against discount rate and approximate the IRR of the project.

Solution

The discount factors for 10%, 14% and 16% are taken from Table 4.5. The present values in the table are obtained by multiplying the net revenues (cash flow) by the appropriate discount factor. The NPV is obtained by subtracting the capital cost from the sum of the discounted net revenues.

Table 4.11: NPVs of Project Using Different Discount Rates

Discount Rate		10%		14%		16%	
Year	Cash Flow (A)	Discount Factor (B)	Present Value (EURO) = (A) x (B)	Discount Factor (C)	Present Value (EURO) = (A) x (C)	Discount Factor (D)	Present Value (EURO) = (A) x (D)
0	-120,000	1.000	-120,000	1.000	-120,000	1.000	-120,000
1	36,000	0.909	32,727	0.877	31,579	0.862	31,034
2	34,000	0.826	28,099	0.769	26,162	0.743	25,268
3	32,000	0.751	24,042	0.675	21,599	0.641	20,501
4	30,000	0.683	20,490	0.592	17,762	0.552	16,569
5	28,000	0.621	17,386	0.519	14,542	0.476	13,331
6	26,000	0.564	14,676	0.456	11,845	0.410	10,671
		Gross NPV =	137,421	Gross NPV =	123,490	Gross NPV =	117,374
		NPV =	17,421	NPV =	3,490	NPV =	-2,626

The NPVs for the three different discount rates can be plotted on a graph of NPV (y-axis) versus Discount Rate (x-axis). The IRR for Project 2 above is approximately 15.1%

If you repeat this calculation for Projects 1 and 3 in Example 4.7, then you will obtain the following values for the IRR:

Project 1 = 15.34%

Project 3 = 14.11%.

This is the same ranking order as the above NPV calculations. Although it is not necessarily always the case, in general the NPV and IRR methods lead to the same acceptance or rejection decision.

One should be careful to note that they are some **pitfalls** in applying the IRR rule.

Lending or borrowing?

CASH FLOWS (EURO)				
Project	C0	C1	IRR Percent	NPV at 10 Percent
A (Lending)	-1,000	1,500	50%	364
B (Borrowing)	1,000	-1,500	50%	-364

Consider the following projects A and B:

In the case of project A, we are lending money at 50 percent. In the case of B, we are borrowing money at 50 percent. When one lends money, one wants a high rate of return. For Project B, NPV increases as the discount rate increases. Obviously, the IRR rule will not work in this case: we have to look for an IRR less than the opportunity cost of capital.

Multiple rates of return:

This case might occur when there is more than one change in the sign (i.e. inflow or outflow) of the cash flows. There can be as many IRRs for a project as there are changes in the sign of the cash flows. There are also cases in which no IRR exists!

Mutually exclusive projects:

Firms often have to choose from among several alternative ways of doing the same job or using the same facility. In other words, they have to choose from among mutually exclusive projects. Here too the IRR rule can be misleading.

Consider Projects A and B:

CASH FLOWS (EURO)				
Project	C0	C1	IRR Percent	NPV at 10 Percent
A	-10,000	20,000	100%	8,182
B	-20,000	35,000	75%	11,818

The IRR rule seems to indicate that if you have to choose, you should go for Project A since it has the higher IRR. If you follow the NPV rule, you will choose Project B and be EURO 11,818 richer. The solution to this is to look at the IRR on the **incremental flows**: you first consider the smaller project. If its IRR is higher than the opportunity cost of capital, you know that it is acceptable. Then, you ask yourself if it is worth making the additional investment in Project B. If the IRR on the incremental investment is in excess of the opportunity cost of capital, you should prefer Project B. If the IRR on the incremental investment is in excess of the opportunity cost of capital, you should prefer project B to Project A. Unless you look at the incremental expenditure, IRR is unreliable in ranking projects of different scale and one should thus stick to NPV analysis. Note that the IRR rule is also unreliable in ranking projects which offer different patterns of cash flows over time.

As a conclusion, one can see that IRR is a less easy rule to use than NPV, but, used properly, it gives the same answer. Once you know the pitfalls, you should be able to use the IRR rule properly.

2.6.5 *The Four-step Procedure to Value a Capital Investment*

1.	Forecast the project's incremental (after-tax) cash flows;
2.	Assess the project's risk;
3.	Estimate the opportunity cost of capital, that is, the expected rate of return offered to investors by the equivalent-risk investments traded in the capital markets; and
4.	Calculate NPV using the discounted cash flow formula.

In fact, we have to consider each project each project as a mini-company and ask ourselves: how much would that mini-company be worth if we spun it off as a separate, all equity-financed company? How much would investors be willing to pay for shares in the project?

It is important to emphasize that in order to convince an investor that your investment project is a good project, you should conduct a **sensitivity analysis** to identify the principal threats to your project's success. You should consider in turn each of the determinants of the project's success and estimate how far the present value of the project would be altered by taking a very optimistic view or a very pessimistic view of that variable. You should estimate the net present value of your investment project under different scenarios and compare this estimate with the base case.

2.7 Factors Affecting Investment Appraisal: A Detailed Example

In discussing investment appraisal, it is important to realize that there are a number of factors which bear on the final outcome. There are practical considerations which must be taken into account. Other

costs or contributions such as tax or grants can have a considerable impact on the feasibility of the project. The major factors impacting investment appraisal on an energy project are:

- * **Government Grants**
- * **Tax**
- * **Variability of Energy Prices.**

Government grant schemes from a national government or from, say the European Commission, are considered capital contributions. Whilst they may not be given in the beginning of the project, they may be used in later years of the project. Obviously, in either case, NPVs will be improved by diminishing/reducing the initial capital costs of the project.

Tax is a two edged sword. On the one hand, the additional cost of tax on net revenues will decrease the attractiveness of a project. On the other hand, tax incentives (e.g. tax allowances) will enhance attractiveness. You will always have to forecast your cash-flows on an after-tax basis. A delay in tax payment will of course increase the NPV of the project.

Energy prices are very volatile and may be very difficult to predict over the lifetime of a project. After the oil price shocks of the 1970s, there was a surge in the oil price. In the late 2020s, the price of fuel oils dropped and have remained relatively low. The low prices caused many companies to simply switch fuels rather than invest in new measures for existing equipment. While preparing your cash flows forecast concerning energy revenues, you will have to assume the expected variation in energy prices during the expected life-time of the project.

Example 4.9

Energy Works Plc is planning to invest in energy project. The initial investment is estimated at EURO 100,000. Additional investment if the scheme proves a success is planned for year 2. The additional investment amounts to EURO 50,000 which will come from a regional development grant.

According to a technical study, the running costs of the current compared to the improved yields generate the revenues over the course of five years.

Year	Revenues
1	30,000
2	35,000
3	28,000
4	25,000
5	23,000

According to the tax regulations, the proposed project would have the following tax liability:

- (1) Corporation Tax = 40% of net revenues. This means that the tax will be paid by the company at the end of each year of operation.
- (2) Tax Allowance of 50% of first year. This tax allowance means that 50% of the tax on the capital investment can be offset against tax paid on the project.

For example, the calculation of the tax is as follows:

$$0.40 \times \text{EURO } 30,000 = \text{EURO } 12,000$$

The tax allowance is:

$$50\% \times \text{EURO } 12,000 = \text{EURO } 6,000.$$

The EURO 6,000 is directly related to the capital investment in the energy project but its application against any tax which the company may incur.

Other Data to Example:

Depreciation is over the five-year life of the project at EURO 18,000 per year and the salvage value will therefore be EURO 10,000. The salvage value is considered as a revenues in year 5. We assume a discount rate of 12% based on current interest rates and no inflation.

Table 4.12: Effect of Tax and Grant on NPV

Year	Capital Investment (EURO) (A)	Net Revenues (EURO) (B)	Depreciation (EURO) (C)	Tax Incentive (EURO) (D)	Tax at 40% (EURO) (E)	Additional Grant (EURO) (F)	Net After Tax (EURO) (G)	Discount Factor (12%) (H)	Present Value (EURO) (I)
0	-100,000	none	none	none	none	none	-100,000	1.000	-100,000
1	none	30,000	18,000	6,000	-2,400	none	27,600	0.893	24,643
2	none	35,000	18,000	none	-6,800	50,000	28,200	0.797	22,481
3	none	28,000	18,000	none	-4,000	none	24,000	0.712	17,083
4	none	25,000	18,000	none	-2,800	none	22,200	0.636	14,109
5	10,000	23,000	none	none	-9,200	none	13,800	0.567	7,830
								Gross =	136,145
								NPV =	36,145

The columns A through H represent:

- A EURO -100,000 is the initial capital investment and the EURO 2,500 is the salvage value.
- B Net revenues on the new scheme compared to the existing scheme.
- C Depreciation
- D Tax allowance for year 1 only.
- E Tax for year 1 onwards = $-(B - C + D) \times .40$.
- F Additional tax-free grant of EURO 50,000 for year 2 only.
- G Net After Tax = $B + E$.
- H Discount factors for 12%.
- I Present Value = $(G \times H)$.

3 FINANCIAL APPRAISAL

Once the proposer has analysed its project on a cash basis (investment appraisal - above) and find that it would lead to a positive NPV, he will have to look at ways to finance it.

Financing is principally a **marketing problem**. The company tries to split the cash flows generated by its assets into different streams that will appeal to investors with different tastes, wealth and tax rates.

It is very difficult to find financing schemes with NPVs significantly different from zero. This is so because of the nature of competition of the financial markets. Still, remember that a good financing decision will generate a positive NPV. It will be one where the amount of cash raised exceeds the value of the liability created. But if selling a security generates a positive NPV for you, it must generate a negative NPV for the buyer. For example, if you get a subsidised loan from the government, it is a good deal for your firm, but a negative NPV investment from the government's point of view (see below).

The different sources of finance are the following:

1. The simplest and most important source of finance is **shareholders' equity**, raised either by stock issues or retained earnings.
2. The next most important source of finance is **debt**. Debt holders are entitled a fixed regular payment of interest and the final repayment of the principal. But the company's liability is not unlimited. If it cannot pay its debts, it can file for bankruptcy.

It is important to note that (most) tax authorities treat interest payments as a cost. This means **the company can deduct interest when calculating its taxable income**. Interest is paid from pretax income. Dividends and retained earnings come from after-tax income.

If one looks at the ways in which companies raise and spend money, one finds in general:

1. Internally generated cash is the principal source of funds;
2. Internally generated cash does not provide all the money companies need. As a consequence, companies come to the capital markets for more money; and
3. There are cycles in company financing. Sometimes companies prefer to issue debt, sometimes equity. In part, this reflects their attempt to maintain a targeted debt-equity ratio.

MODIGLIANI and MILLER (MM) have stated that **the value of a company** (the value of all its assets) **is independent of its capital structure**. MM agree that borrowing increases the expected rate of return on shareholders' investment. But it also increases the risk of the company's shares. MM show that the risk increase exactly offsets the increase in expected return, leaving the investors no better or worse off. The MM proposition depends on a very strong assumption--the existence of perfect capital markets. We will see below that once distorting facts such as taxes are introduced, the proposition of MM no longer holds true. Yet, it remains a powerful proposition, which is useful in calculating Net Present Value of investment projects.

Choosing the Company's Debt-Equity Ratio

When taxes are taken into account, the value V of the investment project increases. Thus, we have the following relationship:

$$V = \text{Value if all-equity financed} + \text{PV of tax shield}^5 - \text{PV of costs of financial distress.}$$

The tax shield is due to the fact that interest payments are considered in many jurisdictions tax deductible expenses. As a consequence, tax shields can be valuable assets as they decrease the tax bill of the company. Usually, tax shields depend only on the marginal corporate tax rate and on the ability of the company to earn enough to cover interest payments. Tax shields, therefore, are usually discounted at a relatively low discount rate, the most common assumption being that the risk of the tax shields is the same as that of the interest payments generating them.

Debt may be better than equity in some cases, worse in others. One could think that it should finance its company with debt as much as possible, as this would lead to an increasing value of its tax shield. In fact, one should take into account the negative impact of financial distress and should finance investments with debt up to the point where the present value of financial distress is equal to the present value of the tax shield. When financial distress becomes all too significant, it will offset the advantages of the tax shield and decrease the value of the company. Despite this, one should keep the following four points in mind when considering the capital structure of a company:

1. **Taxes:** If a company is in a taxpaying position, an increase in leverage reduces the income taxes paid by the company. There is a tax advantage to borrowing for companies that are able (or are reasonably certain) to use the interest tax shields.⁶
2. **Risk:** with or without bankruptcy, financial distress is costly. Other things being equal, financial distress is more likely for firms with high business risk than with low business risk. For this reason high business risk companies generally issue less debt than companies with low business risk.⁷
3. **Asset Type:** the costs of distress are likely to be greater for firms whose value depends on growth opportunities or intangible assets. These firms are more likely to forego profitable investment opportunities and, if default occurs, their assets may erode rapidly. Hence, firms whose assets are weighted toward intangible assets should be able to borrow significantly less, on average, than firms holding assets you can kick!
4. **Financial slack:** in the long run, a company's value rests more on its capital investment and operating decisions than on financing. Therefore, you want to make sure your firm has sufficient financial slack, so that financing is quickly accessible when good investment opportunities arise. Financial slack is most valuable to firms that have ample positive NPV growth opportunities. This another reason why growth companies usually aspire to conservative capital structure.

⁵ In simple terms the tax shield reduces the company's tax obligations. It is defined as the impact on a company's income tax obligations from a change in a tax-deductible expense, such as interest on debt and specifically, it is the amount of change times the applicable tax rate. The tax shield assumes the company has sufficient taxable income to offset the change in the expense. Should the company be generating losses, the tax shield will then be equal to zero.

⁶ Note that borrowing is not the only way to shield income. For example, accelerated write-offs of plant and equipment can be used to reduce corporate taxes.

⁷ The risk of a common stock reflects the business risk of the real assets held by a firm. But shareholders also bear financial risk to the extent that the firm issues debt to finance its real investments. The more a firm relies on debt financing, the riskier is its common stock.

Financial appraisal from the point of view of the bank

The examples and techniques described above focused on the financial viability of a project from the point of view of the equity investors. It has to be noted that the banks play another, complementary role and have distinct interests when financing a project.

The banks/lenders main role is to “leverage” the capital invested in a project – i.e. to allow the partial capital invested by shareholders to finance much bigger value projects. In simple language – with only a 25% invested by equity investors, the banks make possible financing of 4 times bigger value project.

By financing projects the banks “convert” the short term money of the depositors (as these can be withdrawn at any time) to long term money (as these invested money are committed for the term of the loan). This is the basic tenet on which banking is built and explains why the banks are so risk averse.

The banks usually review and ensure that the project contracts and agreements are “bankable” – i.e. provide that by adhering to the agreed contract terms the revenues from a project’s operation are as certain as possible and as amounts are sufficient to safely repay back their loan.

The banks’ aim is to minimise the risks to their finance, at the same time achieving maximum profit margin corresponding to an optimal risk/reward ratio. So, a bank will seek to agree on an as higher as possible interest margin and an optimal tenor of the loan in order to balance the risks of a project with maximising its rent out of it.

The most important ratios sought by the banks are Debt Service Cover Ratio (DSCR) and Loan Life Cover Ratio (LLCR). Both seek to estimate the ability of a project to service (pay) its debt.

Debt Service Cover Ratio [periodic] : = Free Cash Flow / Fixed Charges

Free Cash Flow = Net Operating Profit

[plus : depreciation & amortization]

less : increase in working capital

less : incremental capital expenditure

less : tax

Fixed Charges = loan principal + interest

[plus : mandatory dividends, lease payouts]

The DSCR is a historic ratio, estimating how much more free cash flow is available than what is needed for the loan repayment. Usually, the bank seeks that the ratio does not get below 1.20 in the most adverse circumstances and going below 1.10 usually triggers loan default procedures.

Loan Life Cover Ratio: [over remainder of project] :

= NPV of Future Free Cash Flow / Book Value of Outstanding Debt

Please note: it depends on the chosen discount rate, which in this case is the interest charged by the bank.

LLCR tries to estimate are there enough money – free cash flow expected for the life of a project – compared for the total debt of the project. To estimate that, the Net Present Value of the future cash flow is discounted by the loan interest rate and divided by the total loan value.

Before negotiating the term sheet and loan agreement with lenders, the project sponsors have to ensure that the results of their Base Case financial model meet, at least, the minimum acceptable values for these ratios.

Anticipating the Banker's Advice

When you issue debt, you have to persuade the lenders that you will be able to repay their loan. Therefore, companies seeking debt financing usually draw up a set of pro forma income statement, cash flow statement and balance sheets. When you complete these statements, you are simply making your best forecasts of the firm's profit, cash flow, assets and liabilities. These forecasts are regarded with the utmost importance by bankers and are key to a successful business plan.

You may find when you make these forecasts that the firm is unlikely to generate sufficient cash internally to repay the loan (cannot meet the min DSCR requirement). That is not in itself a cause for alarm. But such a result should prompt you to ask two questions:

1. Can the maturity of the proposed loan be extended so that the firm can repay the loan out of income?
2. Is the firm likely to be able to raise the additional equity that it will make possible to repay the proposed loan?

The financial manager should conduct a sensitivity analysis to see how far the profits could decline without imperilling the company's ability to service the loan.

4 INTERACTION OF INVESTMENT AND FINANCING DECISIONS

As stated above, in an ideal world with no taxes, project costs, or other market imperfections, only investment decisions could affect the value of a company. In such a world, companies could analyse all investment opportunities as if they were all equity financed. Companies would decide which assets to buy and then worry about getting the money to pay for them. No one would worry about where the money would come from because debt policy, dividend policy and all other financing choices would have no impact on the stockholder's wealth.

However, the side effects of financing cannot be ignored in practice. The technique that enables you to take them into account is simple:

Step 1: Start by estimating the project's base-case value as an all equity-financed mini-firm;

Step 2: Then adjust this project's base-case NPV to account for the project's impact on the firm's capital structure.

Adjusted NPV or APV = Base-case NPV + NPV of financing decisions caused by project acceptance.

Once you identify and value the side-effects of financing a project, calculating its APV is no more than addition or subtraction. The rule is then to accept projects if APV is positive.

Here are some examples of side effects:

1. **Issue costs:** if accepting the project forces the firm to issue securities, then the present value of issue costs should be subtracted from the base-case NPV.
2. **Interest tax shields:** debt interest is a tax-deductible expenses. Most people believe that interest tax shields contribute to firm's value. Thus a project that prompts the firm to borrow more generates additional value. The project's APV is increased by the present value of interest tax shields on debt the project supports.
3. **Special Financing** (Interest rate subvention, subsidies): sometimes special financing opportunities are tied to project acceptance. For example, the government might offer subsidised financing for socially desirable projects. You simply compute the present value of the financing opportunity and add it to the base-case NPV.

As one can see, calculating APV may require several steps: one for the base-case NPV and one for each financing side effect.

5 Introduction to Approval Process

Each bank has specific procedures for appraising the financial, economic, technical and environmental feasibility of each project proposed for financing. Usually, a bank's (Bank) formal project approval process consists of Concept Clearance, Initial Review, Final Review and review by the Board of Directors. We have outlined below the main elements of each of these components and have especially highlighted the areas in which environmental due diligence is incorporated in each of the project development stages. As a first step, the sponsor may approach the Bank with an initial proposal.

5.1 Project Size

According to its normal procedures, banks do not finance projects where its involvement (usually limited to 35% of long term capital) is smaller than a minimum amount. To finance smaller projects banks are thus trying to develop mechanisms lines of credit etc.) to offer finance for smaller projects. Proposals for smaller projects would however be welcomed in order to build up a pipeline of projects and justify the development of a dedicated instrument.

5.2 Initial Proposal

In the initial proposal to the Bank, the sponsor should have sufficient information to satisfy the requirements of the Bank. The sponsor has two choices: either to prepare a synopsis of the business or the business plan itself. If the sponsor prepares a synopsis of the business, then he must also prepare a cover letter with a synopsis of the business plan, which includes the following information:

- 5.2.1 Information on the sponsors who may be a public company or joint venture or government entity and whether the enterprise is registered as a local or foreign organisation.

- 5.2.2 Business and Project Rationale
 - * A clear explanation of the investment proposal
 - * Whether it is a public or private project
 - * Technical, legal, environmental aspects
 - * Economic and commercial aspects

- 5.2.3 Initial Proposal as to the type and amount of Bank involvement the client requires
 - * As an equity partner

- * As a source of credit (debt financing), or
- * As a combination of both.

However, the sponsor may wish to send a complete business plan to the Bank since the Bank will in any case request a complete business plan if the concept is of any interest.

5.3 Concept Clearance

The information provided in the initial proposal should be sufficient to enable the Bank to determine whether the project fits within its guidelines and strategies and deserves further involvement and work on the part of the Bank. This will lead to the first step in the Bank's approval process, the **Concept Clearance**. Concept Clearance is an internal procedure which all projects must pass before detailed work can commence.

The concept of the project is presented by the project team to the relevant Banking Deputy Vice President for approval to begin work on the project. The Project Sponsors should supply details of the proposed project to the Bank. These details include a description of the property (size and location of each site), a description of major processes, raw materials and waste streams, the historical and current environmental status of the property, available environmental reports, and a description of the proposed modernisation (if any) and the associated environmental impacts. The information should highlight any potential environmental concerns associated with the property. A copy of a corporate environmental policy can also be helpful.

If the project concept is accepted, a **Mandate Letter** will be required from the sponsor which forms the basis of a working agreement with the Bank. It needs to be signed by both parties and sets out the basic working practices of the Bank and the requirements for entering into a working relationship, including allocation of expenses and procedures in the event that the sponsor or the Bank subsequently decides to withdraw from the project.

5.4 Initial Review

The next stage is the **Initial Review** which involves the Operations Committee of the Bank's senior management. At this level, much more detailed information is required as the Bank will make its assessment of the project by analysing the business plan and financial projections and assessing the ability of the project sponsors to implement them. The Initial Review normally occurs one to two months after concept clearance. The Initial Review will usually incorporate the following points:

5.5 A Detailed Description of the Client Enterprise

This should include:

- * Its history
- * Description of production activities
- * Names and biographies of principal managers
- * Bank references
- * Other relevant information

5.6 Financial Statements audited to International Standards

- * It is in the client's own long-term interests to seek guidance from reputable accounting firms.
- * The Bank will ask for full disclosure and will respect confidentiality.

5.7 Financial Projections

- * The purpose of these projections is to inform the Bank of the ultimate financial viability of the project.
- * These include realistic assumptions about costs, prices, etc.

5.8 Relevant Laws

Information on the relevant laws and export/import duties applicable to the project

5.9 Environmental Information

The environmental specialist in the Bank will review the preliminary information and the description of the project, identify the environmental concerns and opportunities typically associated with such projects and define the investigations that will be required. The environmental specialist prepares an **Environmental Screening Memorandum** for the project team, which is incorporated in the documentation presented to the Bank's senior management at the time that they undertake the **Initial Review** of the project. An overview of the investigations and information frequently required is found in the **Environmental Due Diligence** section below.

5.10 Project Preparation

The investigations are always the responsibility of the Project Sponsor, but the Bank can assist, where necessary, in the preparation of consultancy Terms of Reference for environmental studies and in the identification of environmental consultants. If properly integrated in the overall due diligence process, environmental investigations should not delay project processing.

5.11 Letter of Information

The Bank will provide a format for the disclosure of this information. This letter will detail the legal basis of the company. It will also provide information on contracts relevant to the future of the company. The letter should be completed by the company's lawyers and accountants before Final Review.

5.12 Final Review

Final review by the Bank's Operations Committee on the basis of a negotiated term sheet (main terms and conditions of the transaction developed between the sponsor and the Bank) for private sector projects, before going to the Bank's Board of Directors for its approval. This evaluation process covers financial, legal, economic, technical and environmental issues.

The final review normally occurs two to six months after the Initial Review, depending on the client/sponsor and on the project.

It is important to note that the Final Review follows a very detailed preparation of all aspects of the proposed loan, including indicative terms. Detailed terms and conditions of the proposed transaction will be reflected in a term sheet, negotiated and signed between the client and the Bank before Final Review. The term sheet will serve as a basis to prepare the loan documentation.

5.13 Board Review

The project documentation is presented to board of Directors for their consideration. This documentation includes a section on the project's environmental implications and summarises the work that was done on the project.

5.14 Signing/ Financial Closure

Following Board Approval, loan documentation can be negotiated and signed and the loan may be implemented and disbursed.

1 Legal name of sponsor

This is the full legal name of the entity which is applying for finance from a bank.

2 Contact person and location of sponsor

The contact person is the person who understands the contents of the business plan and who has authority to act on behalf of the sponsor to explain the business plan to the bank. The location of the sponsor is usually the official headquarters of the sponsor. The contact person should be reachable at or through the sponsor's address, telephone and fax. The e-mail code, if available, enhances communication.

3 Legal Status of Sponsor

The official name of the enterprise which is included in the business licence, entrepreneur's certificate, or company record or, if it has not yet been recorded, in the Syndicate Agreement, Articles of Association, or Memorandum of Foundation. If the company is in the process of being registered, then the registration documents should be provided together with the receipt of the Court of Registration of the submission of these documents.

The various types of legal status include:

- **Sole Trader:** this is a business owned by a single person such as an individual entrepreneur or an industrial entrepreneur, salesman.
- **Partnership:** this is a business owned by multiple persons. This may have many different forms, such as, unlimited partnership, business associations or limited partnership.
- **Limited Liability Company**
- **Joint Stock Company**
- **State-owned Enterprise or Institution, Local Government's Institution**
- **Co-operative**

If the sponsor's legal status is complex (for example, a joint venture with public and private elements) then this should be explained fully on a separate sheet and attached as an Appendix to the Business Plan Form. The sponsor should also consider setting out the current and future ownership of the business.

4 Identity and location of partners

These are the names, addresses, telephones and faxes of consultants, suppliers, local banks and others who have contracts with the sponsor and who may share in the financial benefit of the project.

5 Sector

This is the economic sector in which the project can be most appropriately categorised. To "specify" means to describe with some detail the type of project within the economic sector.

One of the reasons for this section is to help the bank determine what type of technical expertise is required to evaluate the business plan. Obviously, a proposal for retrofit of a power station will require different expertise from a project that aims to finance a production of biomass.

6 Brief Project Description

This description should avoid technical details! The first sentence should state in lay language the purpose of the project and the remainder should focus on the financial and environmental benefits of the project to the sponsor, the local community, the nation and the bank. You should be able to say all this in less than 100 words.

You will discuss details of the project in the relevant sections of the Business Plan Form. It is very likely that after you finish writing these sections, you will have a clearer view of the project than when you first began. It is therefore recommended that initially you merely note a few salient points in the "brief project description" until you have finished writing the rest of the proposal and then return to this section to fill in the details.

7 Type and Amount of Finance Required

7.1 Type of Finance Requested

You will normally select either debt or equity.

The basic distinction between debt and equity is that debt requires the borrower to repay the amount of the loan (principal balance) plus interest over a certain period of time while in an equity deal, the sponsor has no obligation to pay back the loan or any interest. In the equity deal, the sponsor pays only dividends and the investor hopes that the sponsor will be successful in the enterprise and the market will recognise this success by bidding up the value of the shares. To cover the bank's equity exposure, there will normally be shareholder agreements which place certain conditions on the way the sponsor runs the business. But the bank in turn gets to own a part of the business.

7.2 Total Project Cost

Details of how you determine this figure are found in [Section 6](#) on "Transaction Costs".

7.3 Amount of Finance Requested

This is the amount which the sponsor seeks from the bank and is a portion of total project costs. Since banks may set upper and lower limits on the amount of money they can loan to clients, the sponsor should check with his banks about what these limits are. The sponsor should be very careful to state the amount of finance requested which is within the bank's limits.

7.4 Other Sources of Finance

- **Sponsor's own resources.** Since banks are generally risk averse, they like to see sponsors risk their own money or capital. The more money or capital the sponsor puts into the project, the greater comfort for the bank. See Introduction for explanation of Project Risks.
- **Local commercial bank.** Some International Financial Institution or a bank like EBRD may have established credit lines with local banks and the local bank therefore may have a strong interest in lending for certain types of local projects, such as energy.
- **Grants.** Outright grants (with no requirement for repayment) increase the net cashflow of the project and thus lower the risk of the project and enhance its attractiveness to the potential lender. For example, grants on safety or energy efficiency may be available through programmes of the European Commission.
- **Other International Financial Institutions.** In a similar vein, other financial institutions may offer loans or preferential finance for energy and safety projects.

8 Expected Revenues Per Year

These figures should be consistent with the figures stated in any technical data appendix that you may wish to provide.

9 Energy Prices (Euro, US\$ etc.)

Whilst energy may be bought and sold in local currency, these prices should be translated into Euro at current foreign exchange rates, which should be stated.

10 Lifetime of the Project

This is the time period in which the continued operations of the project and its benefits will accrue to the sponsor. For example, even though the project may be completed within two years, the lifetime of the equipment and machinery may be expected to last for at least ten years.

11 Expected Implementation Time

This is the time period from the beginning of the project to its completion of construction and beginning of operations.

12 Proposed Start of Implementation

The proposed start date for implementation should be the time when money starts being spent on the project. Depending on the size and complexity of the project, loan review and approval process may take at least three to six months to complete. Therefore the proposed start date would normally not be any sooner than say six months after date of submission of the business plan.

13 Summary Cash Flow Analysis

The figures in this form should be consistent with the figures provided under **Section 11** Cashflow Projections of the Business Plan Form. A brief explanation of the terms used in the summary cashflow analysis are:

- **Capital investment:** the total cost of the installed equipment (excluding Value Added Taxes)
- **Revenue:** this is any incremental change in revenue due to the project.
- **Revenues:** the quantity of energy, materials or equipment to be imported, which would be saved, multiplied by the expected prevailing prices including taxes.
- **Other benefits:** the additional benefits to any revenues generated by the investment. These benefits should be explained in more detail in **Section 11** of the Business Plan Form or on separate sheets attached as an appendix to the Form.
- **Operation and maintenance costs:** the net additional costs or the net cost reductions to operate and maintain the newly installed equipment.
- **Other costs:** miscellaneous costs incurred to run the project, if any. These should be explained in detail in **section 11** of the Business Plan Form or on separate sheets attached as an appendix to the Form. It is important to note that none of these costs are distinct from and not duplicated in the costs of the installed equipment stated above as capital investment.
- **Depreciation of the installed equipment:** not a cash cost but a noncash expense that reduces taxable income.
- **Tax:** corporate tax rate. The impact of tax is twofold. On the one hand, if the investment is successful and the company has a net profit, the company's taxes will increase. On the

other hand, where the project has involved capital expenditure, the company may be able to claim capital allowances from the government which will help reduce the tax burden. To calculate the tax cashflows accurately, you need will need to forecast the profits from the investment. In any case, once the incremental cashflow has been forecast, then the payment of taxes should be automatically included in your cashflow forecasts.

- **Profit After Tax:** This is the amount remaining after deducting tax from the Pre-Tax Profit.
- **Net Cash Flow:** This is the amount that you have in hand (That is, estimated actual amount of cash) available that will be used to pay creditors and investors.

14 Data Table

- **Quantity of Output Produced:** This estimated figure gives the lender an idea of the total output of the project.
- **Quantity of Revenues:** This estimated figure gives the lender an idea of how “efficient” the project may be.
- **Price:** This price gives the lender an idea of the prices used in the forecasts.

Business Description

1 Nature of the Business

What is the core business activity that the sponsor is engaged in? For example, it may be an electricity generation or it may be equipment manufacturer. The business is defined by the products it makes and sells for its customers and clients. In market economies, businesses exist on the strength of market demand. Ultimately, market demand defines the genuine nature of the business.

There are a number of areas to draw from when making a statement which defines the nature of the business. You may wish to consider the answers to the following questions to make a brief statement about the nature of your business, its strengths, risks, current and future plans:

What do you intend to sell?

- Products
- Services

What is your position in the market?

- Will it be based on high quality and high price? or
- High volume and low price?

Who will be your customers?

- Individual members of public: what are their social class,
- Geographical area and particular interests?
- Manufacturing: what is the size, area and nature?

How will you find new customers?

- Passers-by who walk into business location.
- Press advertisements?
- Direct mail?
- Referrals?
- Salesmen?

How will you increase the sales from your existing customers?

- Market survey and analysis

How will you obtain the products?

- Manufacture from raw materials
- Assemble from intermediaries
- Purchase from manufacturers

Who will provide your company's services to customers?

- Just your business
- Your business and partners
- Sub-contractors or franchisees

How will you sell?

- Direct to the public
- Direct to manufacturers
- Through large chain stores

- Through individual shops
- By mail order
- Through a distributor

How will you support your sales?

- What delivery will you provide?
- In what geographical area?
- What is the after-sale service?
- What are the trade terms? For example, what is the financial assistance for leasing or loans?

2 Strengths of the Business

The strengths of the business can be divided into internal strengths or capabilities of personnel and plant and external opportunities in the marketplace. Amongst the major questions you should consider are:

- Are your personnel and senior management equipped with proper technical, marketing, selling and negotiating skills?
- Does the business have a unique selling point? In other words, does your company offer a special benefit in its products or services which are not offered by competitors?
- Does your company have strong customer loyalty?
- Does your company enjoy a special licence or subsidy from the government?
- Is your business in close proximity to the markets?

3 Risks

The risks are both internal and external - that is, factors which the management can control and factors which are beyond the control of management. Efforts by management should focus on controllable and critical risks. The critical risks to the business are those events, activities or persons without which the business is not likely to survive. For example, if a company enjoys a monopoly in its local market then the major risk to the business is political and perhaps regulatory.

4 Current Situation

The current situation is a description of recent events in light of current cash flows. Is the company improving or is it facing difficulties? Does it have good prospects in the near term or no new prospects?

5 Future Plans

The future plans should describe ways in which the sponsor may use the strengths of the business or decrease the business risks.

1 Background to the Project

This describes how the project was conceived. Who conceived the project? Was it from someone in-house or was it initiated by an independent consultant? Who within the company is involved in the project?

2 Scope of the Project

This describes the breadth of the project in terms of time, space and number of personnel directly and indirectly involved.

3 Rationale for the Project

How is the project related to the core activities of the business? The project has a good rationale and is justified if it is part of the company's core business.

4 Arrangements for Implementation

This is a summary of the planning and contractual arrangements necessary for the completion of the project. For large infrastructure projects, tendering for contracts will ensure that fair and competitive prices are obtained. The bank will be looking to protect its investment capital from any possible conflict of interest or fraud. Details of any off-take agreements (contracts that begin with the approval of finance) should be noted.

5 Infrastructure Background

Locations owned or rented fixed capital assets including:

1. Plants
2. Warehouses
3. Offices
4. Stores (Retail)
5. Other

6 Description of supplies

1. Energy/Electricity
2. Gas
3. Raw Materials
4. Premanufactured Parts
5. Other(s)

In this section, it is important to have an imagination. You will need to think of how the project will benefit the local and national economy and environment as well as your own commercial prospects. The greater number and deeper the benefits, the more likely that the project will have both short and long term local support and thus, an increased likelihood of success.

1 Revenues and environmental improvements

The types of benefits that come from the project are many and varied. It is important to recognise those which can be directly quantified in money terms, such as revenues in raw materials, fuel and electricity revenues, reduced labour, etc. and those which may be only indirectly quantifiable, including improved product quality or marketability, and which might produce a benefit in terms of increased sales. There may also be other benefits, which are not quantifiable at all in money terms, but may have a bearing on the project. These include aspects such as safety, improved working conditions and environmental benefits.

The benefits likely to arise from a viable project include:

- New or increased energy generation
- Improved efficiency of generation
- Lower energy consumption
- Lower fuel costs
- Lower water costs
- Lower labour requirements
- Reduced overtime
- Reduced maintenance
- Fewer rejects
- Reduced product finishing
- Improved throughput rate
- Savings in floor space
- Improved scheduling
- Improved quality
- Improved product specification
- Improved product range
- Improved safety
- Reduced greenhouse emissions
- Reduced harmful emissions
- Improved health and safety
- Reduced environmental fees
- Provide qualitative better services.

Other types of economic benefits which may result from the project should be made explicit. For example:

2 Export promotion

Will the project result in an increase in exports or support exports and therefore result in net gains to the local community and nation?

3 Import substitution

Will the project provide for the substitution of current imports with goods or services produced locally?

4 Job creation

How many jobs will be created directly and indirectly by the project?

5 Productivity improvements

Will the project result in enhanced performance and increased productivity of plant and workers?

6 Technology transfer

Will the project involve the transfer of technology to and from the local community?

7 Management development

Will the project involve the enhancement of skills, knowledge and competence of the workforce?

These are some of the considerations that may be taken into account in describing the benefits of the project.

1 Background

The section describing the personal details, background and experience of the main parties and the top management of the project should be written with the purpose of convincing the bank that the management to the project can be trusted to complete the job. For example:

- What kind of technical credibility does the management have?
- Have they completed other similar projects?
- How does their background enable them to accomplish the objectives of the project?

2 Financial data

This gives the bank a view on the financial strength of the sponsor. More financial information will be included in [Section 11 and 12](#) of the Business Plan Form.

3 Proposed Financial Contributions and Exposures

This is a brief summary of the financial contributions of each of the partners to the project.

There are many complexities to financial risk but the question here is whether the partner will be personally liable for payment on default. If the partner is personally liable then the bank has full recourse against the partner and therefore the bank has greater comfort. Technically, recourse means that in case of default on the loan, the lender has the right to sue an endorser or guarantor for payment. Non-recourse means that the lender has no right to sue for any of the underlying assets beyond that which was pledged by the defaulting party.

4 Rationale for Involvement of Other Partners, If Any

There are many different rationales for a local enterprise to involve other partners. For example, the local enterprise may need a foreign partner in order to meet certain contractual requirements for hard currency. Or, the enterprise may be relatively unknown and thus, in order to bolster its credibility it may enter a joint venture with a well-known international company. Another rationale may be that the company wishes to enhance its political security by teaming up with politically powerful entities.

5 Objectives

5.1 What are the objectives of the business itself?

These objectives may include business, economic, social and environmental goals. It would be helpful to the bank if these objectives were stated in specific enough language so that they can be ascertained, measured, monitored and controlled. To be considered are:

- Short term (within one year).
- Medium term (from end of first year to end of fifth year).
- How are these objectives going to be achieved?

5.2 What are the long term objectives of the business (if any)?

How are these objectives to be achieved?

Project Costs and Timescale

This section sets out in detail the total costs of the project and their justification.

1 Project costs

In this section, you will provide an estimate of the costs of all raw materials, technology, equipment, assets, goods and fees that will be necessary in order to implement and complete the project - basically, all contract costs and operating costs. This should be a fairly detailed breakdown of costs and the major items should be listed first, with smaller or minor costs listed last.

The types of typical costs incurred are outlined in the table below which can be used as a worksheet to estimate project costs. This worksheet is merely indicative and you should take care to make your own list as complete and comprehensive as possible.

Project Costs Worksheet			
Items	Value in Local Currency	Value in Euro	Contributions in-kind Euro
Land			
Building and facilities			
Equipment & Machinery (includes customs duty & fitting costs)			
Transport of equipment or goods, insurance and handling			
Installation			
Start-up expenses			
Training			
Professional fees			
Working capital			
Financing fees			
Costs of registering security			
Cost of insurance policies			
Rental right			
Refurbishment			
Design and consultation			
Others:			
TOTAL			

Contributions in-kind refer to elements within the project that do not need to be purchased but represent contributions (usually in exchange for equity) such as land, buildings, equipment, know-how, licenses. This type of contribution often occurs in joint-venture projects.

1.1 Background Information

All banks require an accurate breakdown of the project costs and the use of funds, especially the use of the lender's funds. This information should be available early in the project preparation.

Typically, the allocation of costs should be amongst land, building, facilities, equipment and machinery, installation, start-up expenses, training, professional fees, working capital, registering security, cost of insurance policies and others. These costs should be split according to local currency, foreign currency (Euro) and contributions in-kind (Euro).

It is important to take into account **all costs** related to the project and the key is to identify incremental costs - those costs which are directly related to the proposed project. Some of the areas which may be of direct relevance to energy efficiency include:

1.1.1 Raw Materials

The raw materials are inputs to the production process. The sponsor needs to show that the assumptions made relating to the quantities and pricing of the raw materials is conservative, and that even on this basis the proposed debt can be paid off with a significant margin of comfort. Where there are large raw material contracts, the lender may wish to take security over any of the supply contracts and this factor should be kept in mind when the contracts are being negotiated.

In considering the costs of the raw materials, it is important to note whether the supply of the raw materials is guaranteed in terms of price and quantity. The operator needs a certain amount of raw material input in order to produce sufficient cashflow. Or, it may be the case that the operator does not need a guaranteed source of raw materials because there is a variety of sources for the raw materials and therefore can depend on the market price.

The question of raw materials relates to the issue of mitigating or avoiding supplier risk, that is, failure of the supplier to supply the raw materials to the operator. Another consideration you may need to keep in mind is how the raw materials (their use, conversion, waste and disposal) relate to the physical environment, which may need to be reported.

1.1.2 Incremental Costs to the Production Process, Premises or Personnel

Normally fixed overhead are not included in the costs of the project. However, if the project requires additional production processes, premises or personnel, then these should be included as incremental costs.

1.1.3 Waste Disposal Costs and Pollution Cleanup

If the project reduces fuel consumption per unit of production, it may spur the increase of production of goods and polluting by-products. By increasing production, there may be costs associated with the greater amount of waste disposal and pollution cleanup.

1.2 Energy and raw materials consumption

The premise of this Guide is that an efficient technology may pay for itself in terms of revenues.

An awareness of the fuel, materials and electricity usage and the expected revenues are important factors for the overall efficiency of the plant. For example, new efficient technology or equipment may lead to a reduction in operating costs, including less maintenance and repair, or they may result in helping increase the flexibility of the production process, thus reducing overall production costs.

Efficiency also reflects on the quality of management - pro-active modern management techniques will strive to continuously improve the efficiency of equipment, machinery and plant. Whilst it may be difficult to quantify, you need to be aware how much time it will take to train staff to act in a different way and to consider whether the morale of the workforce improve or deteriorate in response to the technology.

It is important to note that cost-reduction investment decisions are often a matter of deciding amongst different courses of action. If the costs are the same but the potential benefits are different, it would be easy. But more normally you have to decide amongst two or more investments with differing costs and life expectancies so your method of investment appraisal must be able to compare these investments across similar time-frames.

Whilst in many instances the cost of technology and equipment required for the revenues may be incurred immediately at the start of the project, the resulting revenues will be spread out over a period of time. More details of how to account for the timing of the cashflows will be found in **Section 11**: Cashflows Projections. Any technical, financial and marketing assessments or engineering reports regarding the amount of revenues should be included as an Appendix to the Business Plan Form.

1.3 Basis for the cost estimate

The bank will require the "basis" of the cost estimate which means that the bank will require justifications for the figures stated in the cost estimate. How have the costs been estimated? In order to meet this requirement, the client might consider his answers to the questions in the table below.

Basis for the Cost Estimate

1. Have they come from supplier costs?
2. Have they come from engineering quotes?
3. Have they been featured quotes?
4. Have they come from some other means?
5. Who gave you the information on costs? (Name(s) of person(s) and their qualifications)
 - Did the estimate come from someone within the company?
 - Did the estimate come from an independent contractor?
6. How reliable are these cost estimates?
 - Would they be useful as firm market price quotations?
 - Would they be used as the basis for further negotiations with large buyers?
7. How accurate are the cost estimates? (within 1 to 2%, 3 to 5%, 5 to 10%, 10 to 20%, only half accurate)

Evaluating Costs: Levels of Estimate

Financial appraisal is usually introduced when the project costs are only estimated. Depending on how far the project has progressed, the estimate will have different measures of accuracy. We might distinguish amongst five levels of estimate:

- **Order of Magnitude:** This is a very crude estimate derived by an inspired guess. The inspiration often comes from a similar project which someone else has undertaken and which has known costs, perhaps published.
- **Study Estimate:** This will approximately quantify the costs of the major components, perhaps by telephone calls to possible suppliers, "rule of thumb" calculations, and using blanket figures for installation and civil engineering works.
- **Authorisation Estimate:** At this stage most of the items of cost are known to a sufficient level of accuracy for the project to be submitted for approval by the financial management. The technical feasibility of the project will have been established, the components identified and costed, and the scale of assembly and installation work established.
- **Definitive Estimate:** All outgoings on the project and the timing of those costs will have been established to an extent that the progress of the project could be measured from the costs incurred at any time. The price at which suppliers will deliver components or carry out work will have been agreed, and any major designs or other alterations since the preliminary estimate will have been incorporated. The only margins allowed are those for cost that cannot be established until an appropriate point in the physical installation of the project is reached.
- **Detailed Estimate:** This sets an exact amount for the authorisation of payment of invoices on the project. It is in most cases the final cost. So far as possible, all the causes of cost outside those defined in the estimate have been reduced to zero.

1.4 Sources and dependability (condition and age) of technology and equipment

This is a description of the technology and equipment. The sources and dependability of the technology and equipment are important parts to the project. If the technology is old and in poor condition, then it is unlikely to have very much value. New technology and equipment in new or good condition is likely to carry the best value. Obviously, out of date technology may need more frequent repairs and carry an increased risk of breakdown, which leads to plant ineffectiveness and inefficiency. The bank will look to the company to decrease this risk of old and undependable technology and equipment.

1.5 Assistance to be provided by the technology supplier

The technology supplier may provide advice and training on how to operate and maintain the equipment and machinery. The terms of the training as part of the technology transfer should be examined closely since the value of the asset will be detrimentally affected if this training is inadequate or sub-standard. What specific assistance will the technology supplier provide? How long will this training be provided? How will your company measure the adequacy and competency of the training assistance?

1.6 Timetable of Implementation and Disbursements

The Timetable for Implementation and Disbursements describes in chronological order the major payments that must be made in order to complete the project. These payments should correspond to specific phases in the project. The major disbursements are payments to specific entities, mainly contractors, sub-contractors and suppliers. Whilst these disbursements may be made in local currency, you are asked to specify the amount in EURO.

The timing issue of when costs will be incurred may be critical to the financial viability of the project. In brief, the company should be looking to maximise its resources and the longer these outflows can be delayed, the less costly they are in present value terms. The timing of the costs thus will have an impact on the valuation of total project. What is important here is that the timing of the costs (cash outflows) will need to be co-ordinated with the cash inflows.

In this paragraph, you will need to identify each of the major items to be purchased with a "short technical description". For example, "automatic control systems" or "flue gas analysers" would be sufficient if it is clear that these are major items to be purchased. Technical descriptions of the items to be purchased should be included in a Technical Purchase Appendix.

2 Financial fees

Most Financial Institutions will claim fees when offering and servicing a loan. The fees will vary from institution to institution, their different types of facilities, the creditworthiness of the borrower, available guarantees, the type of project, etc.

Some financial institutions are offering very low interest rates, but you will have to pay different types of fees in addition. Other financial institutions have included some of these fees into their higher interest rate. Evaluating offers from different financial institutions, make sure that you have all the needed information.

Below is a list of some of the fees that might be relevant for your project.

Retainer fee

The Retainer fee is a one-time fee required to cover the Financial Institutions costs for evaluating the loan application. The Retainer fee is normally 0,3 - 0,5 % of the requested loan amount.

Facility fee (Establishment fee, Front end fee)

A Facility fee (establishment fee) is a one-time fee for the commitment, i.e. 1% to 1.5% of committed loan amount. A portion of the fee is paid upon signing the Commitment Letter, with the remainder typically paid upon signing of the Finance Agreement.

Commitment fee

A Commitment fee is a fee to be paid of the undisbursed and uncanceled loan amount (the financial institution having "reserved" the money for you). The Commitment fee is normally 0.75

% - 1.00 % of the undisbursed loan amount and begins to accrue from the date of the signing of the Commitment Letter.

Cancellation fee

The Cancellation fee is the fee paid for the cancelled amount of the undisbursed loan. The fee is normally 1.00 %. The fee compensates in part for the future income that will not be realized because of the cancellation by the borrower.

Prepayment fee

The Prepayment fee is for voluntary prepayments of principal in the early years of the loan (over and above any scheduled amortization). To compensate for the future reduction of income to the financial institution, typically fees are 3 %, 2 % and 1 % in the first, second and third year after the disbursement. Usually there are no prepayment fees after the third year.

Guarantee fee

The Guarantee fee may typically vary between 2 - 6 % of the outstanding principle of the loan, and represents the risk premium assessed by the financial institution.

Maintenance fee

The Maintenance fee is an annual fee covering the anticipated administrative and external costs associated with the ongoing monitoring of the loan. The fee generally averages Euro/USD 10 000 – 20 000 per year.

Reimbursement of expenses

The financial institution requires that it be reimbursed for the direct costs/expenses including legal costs of preparing the loan document, and costs of the legal Due Diligence necessary to ascertain whether the project complies with local laws and regulations. The cost of consultants and experts required to prepare feasibility, technical, environmental or marketing studies are also reimbursed by the borrower.

Legal fees for a small deal in a country with an established body of law can be as low as Euro/USD 20 000 or as high as USD 100 000. For more complex and legally challenging loan agreements and transactions, the fee can be substantially higher.

Export Credit Financing

For Export Credit Agencies (ECA) guarantee fees are normally upfront, and you will have to pay before the guarantee is issued. The price of guarantee will depend on elements like:

- Public or private buyer
- Period of draw downs and of repayment
- Country
- Risk

3 Arrangements for Implementation

3.1 Description of contractors in charge of implementing major components of project and rationale for their selection

The bank will rely on the sponsor to implement directly, or to appoint contractors to implement, the project in a timely manner and in a cost-effective way. In order for the bank to assess the risks connected with the implementation of the project, you will be required to describe the arrangements for implementation which includes a description of the major components of the project, the names of the contractor in charge of each component and the reasons for selecting the

particular contractor and its relevant track record. The major components of the project include amongst other things the sourcing of raw materials, construction of buildings and plant, delivery of fuel stock, marketing and after-sales support. In general, a major component can be thought of as any process which adds value to the product and which is within the control of the company and it represents a major cost in the project.

The reasons for selecting any particular contractor should include business confidence and trust in the contractor's performance. Perhaps the contractor has done business before with the company. In any case, the track record of the contractor is important because it qualifies the contractor in terms of its experience in work of a similar kind. Dates and types of contracts in which the contractor was previously engaged would be relevant.

3.2 Nature of the contracts with the contractors in charge of implementation

In this paragraph, you are asked to summarise some of the major features (terms and conditions) of the contracts with the contractors in charge of implementation. Some of the major points which you should cover include:

3.2.1 *What are the terms and conditions of the completion covenants?*

Are there any penalties for late completion or bonuses for early completion?

3.2.2 *What are the terms of the progress payment schedules?*

These payments should be conditioned upon the completion of specific tasks or events. What are those specific events?

3.2.3 *Performance bonds associated with implementation*

What types of performance bonds are required for implementation?

3.2.4 *Is the agreement with implementing contractor a turnkey contract?*

In other words, is the contractor in charge of constructing and implementing the whole business process?

3.2.5 *Other types of special or unusual conditions*

These can be any kind of events which are critical to the performance of the contract.

3.3 Explanation of any cost contingency built into the project costs.

In recognition that there may be events outside the control of the company, contingency costs are usually built into the project costs in order to help ensure that project funding will be available in case these events occur. From the perspective of the lender, the bank would like to know what types of risks are foreseen by the applicant for funds and what contingencies are included.

3.3.1 *What are the built-in contingency costs to the project?*

This is a listing of the of contingency costs, their amount and the conditions under which they take effect.

3.3.2 *What are the justifications for these contingency costs?*

There may, for example, be cost contingencies built into equipment purchases and working capital. These assumptions should be explained.

3.3.3 *If there are provisions for cost overruns, what are the reasons for assuming that such cost overruns may occur?*

Whilst provisions for cost overruns are normal in project finance, it is important that this risk is covered to ensure the successful completion of the project.

3.3.4 *How has the company ensured that there is sufficient back-up funding in the event of cost overruns?*

It usually the case that the sponsor will need to have extra facilities to sufficiently cover any extra costs.

3.4 What is the proposed method for purchasing goods, services and equipment with the bank's funds?

Whenever possible preferred method is by tender. That is, at least three contractors should bid for the work and the procedure should allow for the best price and quality as possible. However, exceptions to this general rule should also be explained.

3.5 What is the justification for using any other method?

For example, there may be laws or regulations which require certain procedures to be undertaken.

3.6 Is there any reason not to use competitive tendering?

These are rather exceptional circumstances and should be explained fully.

4 Procurement Issues

In addition to the national legal requirements on procurement, some banks, like EBRD, the World Bank, European Investment Bank and other multilateral financial institutions require transparency and arm's length procurement when approving the funding of a project so the sponsor is asked to address this area carefully. At an early stage, the bank will identify procurement issues and in particular, the bank will:

- Determine whether public sector or private sector procurement rules are applicable
- Indicate uses of proceeds and likely procurement procedure
- Highlight exceptions to open tendering if it is a public sector operation
- Ascertain whether or not there is a likelihood of advance procurement action or contracting (i.e. before operation approval)
- Ascertain the need for special implementation and contracting risks and arrangements
- Determine whether the sponsor is likely to be a supplier or contractor
- Ascertain if used equipment is to be procured.

According to the bank's internal rules for procurement, public sector operations are operations:

- To or for the benefit of a government or an entity or undertaking that is controlled or majority financed by the public sector of the country of operation, or the procurement procedures of which are subject to regulation or control by a government or public agency, other than such entities or undertakings that, in the bank's judgement, are operating autonomously in a competitive market environment and are subject to bankruptcy or insolvency law; or
- Guaranteed by the state or a public agency or instrumentality of the country of operations.

Operations that do not fall within the definition of "public sector operations" or "concessions" (as granted by the bank) are deemed by the bank to be "private" for procurement purposes.

1 Description of products or services

You may provide the names of each of your products or services, a brief technical description and the proportion each will contribute to the total turnover. The total percentage contribution of all the products and services should add up to 100 percent and these figures should correspond to information you will supply on the profit and loss statement in the **Appendix Proforma Financial Statements** to the Business Plan Form. If your company is selling more than four products or services then use separate sheets to provide the relevant information.

2 Pricing and Costs (breakdown of the cost of materials)

For each product or service, you may wish to provide the variable costs associated with the product or service.

2.1 Sources of cost estimates

In nearly all cases, the source of cost estimates will be the costs the company actually pays. Therefore, if you yourself do not pay for the costs, then how are the costs estimated?

2.2 Explanation of price estimates

You may also wish to provide information on how you arrived at the sales forecast estimates. For example, perhaps you have conducted a market survey? If so, then a summary of this report should be included here and the market survey report should be attached as an Appendix to the Business Plan form. Whatever information you supply, this will provide the bank with a basis to check the actual costs.

Whilst there are many different ways to make price estimates, there are three good ways you may use:

- 1 Cost-plus price: What does it cost you to produce or provide?
- 2 Competitor's price: What do your competitors charge?
- 3 Market price: What the market will bear?

3 Market Description, Location and Size

The nature of the market for the enterprise's products or services:

The purpose of this section is to describe the market of the company, its general characteristics, customers, competitors and factors affecting the growth of the market and the position of the company within the market.

3.1 Description of the market that the business is in:

A company is usually described in terms of the industrial or commercial sector in which the company is engaged accompanied by a brief description to whom the company sells. For example, the company may be an electric power company that sells electricity to a region or the company is an electrical components producer that sells goods to a wide variety of clients. For this paragraph, it is sufficient to describe what the company sells and to whom.

The survival and existence of a business in a market economy is wholly dependent on market demand. That is, in simple terms, the company survives because it satisfies the needs of customers. Thus, a deeper description of the market your business is in entail a description of your customer's needs. These should be detailed in the paragraphs below.

3.2 Geographical area of the company's market

The geographical area of the market can be potentially the population of the whole world. But this is not what is meant here. The geographical area should be limited to the area where you think your primary customers reside. Where will you see most of your income coming from? Where do your customers typically reside?

3.3 Size of the company's market (Euro per year)

The question here is "how big is your market?" This means not just your company's sales but the size of the total market in which you compete in. You should calculate how many units can be sold to potential customers per year and multiply this by the price per unit. This will be a gross figure. If you have various estimates of the size of the total market, you may mark these in terms of a range from pessimistic to optimistic.

3.4 Description of the market environment

Some of the questions to consider are:

- Is the market price sensitive?
- Is it very competitive or not competitive?
- Is it a mature market with established market leaders or relatively new market with no clear market leaders?

4 Type of Customers - Characteristics of Customers of the business

This is fundamental information which your company must clarify and re-clarify if it is to survive and thrive. You should provide a customer profile. Who are your customers? Describe your customers as specifically as you can. This should include the names, type or profile. In order to determine the characteristics of your customers, you may need to gather the following information:

- The geographical areas in which you plan to trade
- The characteristics of people most likely to buy your goods
- The characteristics and requirements of intermediaries you hope to do business with
- The particular type of intermediaries who favour your products or services
- The characteristics of the organisations you want to do business with.

Within these organisations, identify the types of people (by position or job title) you will have to convince of the value of your product/service in order to gain sales.

5 Competitor's analysis

In this section, you are asked to identify your main competitors in terms of product or service and their respective market shares.

6 What is special about your own product or service? (What is its unique selling point, if any?)

Since the survival of a company in a market economy depends on market demand, it follows that the particular niche or special requirements which the company fulfils for the customers is its most important characteristic. Its so-called "unique selling point" gives the company's products and services a unique psychological label within the minds of customers and enables them to identify the products and services to some particular need which the customers need fulfilled. Without this unique selling point, why should the customer buy your product or service over your competitors?

6.1 Advantages of your product or service over the competition

This is similar to the issue of the "unique selling point" except that here the focus is on the particular advantage which your product or service has over competing products and services. For example, in one case, your advantage may be in price. But in other instances, your advantage may be in terms of quality, delivery, after-sales service, finance and so on. It is important to remember that a price advantage can be quickly eroded and therefore may not likely be an advantage for very long. It is therefore recommended that the company look to have a comparative advantage based on other factors which is really part of the definition of the product and integral to the definition of the customers' needs.

You may wish to refer to the "Benefits" stated in **Section 4** of the Business Plan Form.

7 Factors affecting the growth of demand

7.1 Description of factors affecting growth of demand

What are the factors affecting the growth of demand for your company's products and services? There are two types of factors: general market factors and specific market factors. General market factors are those which the company has no control and include interest rates, whether the product is a necessity (such as spare parts) or an additional convenience, the business and consumer confidence, the inflation or deflation rate. Specific market factors are those which the company can control or strongly influence. For example, the image of the company and the product via advertising. The limitation on the growth of demand is likely to be related to communications or the lack thereof to the appropriate target audience. In this paragraph, it is important to show both general market factors and specific factors which limit the growth of demand.

7.2 Is the company's market growing, stable or in decline?

This information will give the lender an idea of the market risk of the company. That is, if the company is in a growing area then it is likely to have more opportunities for growth in profits. On the other hand, if the market is declining then the company may be on a slippery slope and may be in danger of closing after a few years. A stable market implies that there may be intense competition amongst competitors and little opportunity for growth except at the expense of competitors' losing market share.

8 Financial Position of Buyers

The stronger and more secure the financial position of the buyers of the company's products, the better it is for the company. The company in other words will carry less of a risk of buyers' default and a greater likelihood of continuing business if the buyers are financially strong and financially stable. The major questions to consider include:

- 1 What is the financial position of the buyers of the company's products and services?
- 2 Are the buyers financially strong or weak?
- 3 Do they command any credit from the business?

Regulations and Environment Information

1 Key regulations required from the authorities

You will provide a list of key regulations that govern the transaction. The regulations may require permissions from regulatory authorities. The regulations should be specifically cited by date and by their official title.

2 Key permissions required for the transaction

Are there any permits which the government must grant to the sponsor before this transaction will be allowed?

1. From national level
2. From state or regional level or
3. From local or municipal level.

These are self-explanatory items. Obviously it is important that the specific conditions of the permits, their extent and effect, be understood and complied with sponsor. It is also important the sponsor communicate any peculiar interpretations of what these conditions may mean for the bank. For example, any adverse effects on the title and ownership of land and facilities resulting from the sponsor's non-compliance.

3 Permit requirements

What are the specific permit requirements, if any, for this project?

These are permits from regulatory authorities or government agencies such as housing, tax, welfare, energy and so on.

4 Environmental regulations

Are there particular environmental regulations which must be complied with in order for the transaction to be approved in the jurisdiction in question? You are also asked to list all the relevant federal, regional and local environmental and worker health and safety requirements for the project. This list or register of relevant laws should include the official name and date of particular laws and regulations. If there are specific written requirements, summaries of negotiations with an ecological committee, discharge and/or emission permit conditions or other matters with legal or local community then copies of these should be included as an appendix to the Business Plan Form. The following sections explain what types of environmental information usually the bank requires of the sponsor.

5 Environmental Information

5.1 Introduction

Environmental issues are of increasing concern to banks throughout the world since the value of the transaction may be drastically influenced by past or future contamination and failure to comply with regulations. Potential environmental liability is a species of legal risk and as such

must be treated with utmost seriousness and thoroughness. The bank's position is to see that the environmental risk is reduced to minimum or avoided.

5.2 Environmental Due Diligence

The bank conducts environmental due diligence along with financial due diligence on all of its potential projects. Most banks are guided by IFC's environmental guidelines, but some banks, have their own guidelines. The requirements for these projects vary, depending on the nature of the project, the potential for environmental impact of the project, the proposed use of bank funds in the project, potential environmental liability or risk associated with past or future operations, conditions for worker health and safety, and other related issues.

Environmental due diligence is conducted at the same time as financial due diligence. Initial information on the project and the environment will assist bank staff in screening the project and setting the environmental requirements. It is essential, that the investigations or information requirements on a proposed project are undertaken early in the project's review schedule, so that the environmental requirements are completed prior the bank's Final Review and will not cause delay in the project approval process. Often environmental investigations uncover problems or potential liabilities which must be taken into consideration during negotiations and for which further studies or management plans must be developed. Typically, environmental investigations determine how a project will perform against national and international standards and how management practices compare with best practice elsewhere.

Depending on the type and the size of the project, the following environmental investigations may be required as a result of the project's initial screening:

5.3 Environmental Audit

An environmental audit is a study of the environmental status of a facility, property, or operation to establish the status and to identify past or present problems and potential environmental risks and liabilities associated with the project. The audit will look at the environmental condition of the property, the amount of environmental degradation, observations or records of spills, type of equipment and pollution controls, worker health and safety issues, regulatory compliance record, current and pending environmental regulations that apply to the operation, and the need for additional information. The audit may also help to set the baseline for legal requirements, such as an indemnification agreement, although this should be confirmed by the regulatory authority. The audit must be conducted by a third party, such as an environmental consulting firm, to maintain objectivity.

5.4 Environmental and Social Impact Assessment (ESIA)

An Environmental and Social Impact Assessment (ESIA) is a method of analysis which attempts to predict impacts of proposed projects upon the physical and social environment of the surrounding area (including community and worker impacts).

5.5 Guidelines for Environmental Due Diligence

- 1 Initial information to the bank should describe the geographical and process characteristics of the project, detail the environmental work done to date on the project (included copies, if possible), and give contact information for the environmental persons on the project (name, address, fax, phone).
- 2 Identify federal, regional and local environmental and worker health and safety requirements for the project. This may be a list of laws, written requirements, summaries of negotiations with an ecological committee, discharge/emission permit conditions, etc.
- 3 Clarify legal agreements regarding responsibility (legal or financial) for past adverse environmental damages (contamination, occupational diseases, etc.) such as

indemnification agreements. This is particularly important if there are storage areas, waste handling plants or utilities which are shared between companies.

6 Environmental Contact Person

This person should be knowledgeable of the potential environmental liabilities of the site(s) and is a member of the management committee to the sponsor's project team, or at the very least, has the authority to communicate to the management committee.

7 The Land

The land is what is owned or intended to be purchased as part of the transaction. It is also the major resource which may contain pollution and therefore be may be a source of liability or clean up costs.

7.1 Location

The description of the land should include its legal address and legal description. If there exist ownership documents then copies of these should be attached to the business plan form.

7.2 Historical uses of land

Certain historical uses of the land may have beneficial or detrimental legacy to the current generation of owners and users. It is important to determine as far as possible what these uses were in order to better understand the real risks of the land.

7.3 Current land uses associated with the project site

The current land uses associated with the project site will be related to the allowable limits of pollution according to regulations and best practice.

8 Physical Construction Activities Involved in the Project

This should be a description of the nature of any physical construction activities involved in the project. Physical construction activities may cause some form of pollution. The construction must abide by the construction permits and not violate any laws or permits regarding pollution.

9 Environmental impact assessments or environmental audits carried out for the project

The information contained in environmental impact assessments or environmental audits may identify environmental pollution problems. If the sponsor has conducted an environmental audit then the sponsor must be careful to explain how any discrepancies, shortcomings or failures found in the audit have been corrected or will be improved.

10 Potential environmental liabilities associated with property

Potential environmental liabilities are those company activities which are in possible violation of environmental regulations or other government permits. Potential environmental liabilities may also arise from legal agreements allocating responsibility (legal or financial) for past environmental damages (contamination, occupational diseases, etc.) to the company. This responsibility may be in the form of indemnification.

11 Proposed measures for environmental mitigation

After identifying potential environmental problems in the previous sections, the sponsor should state specific ways in which these problems can be rectified, eliminated or transferred. This is important from the bank's point of view since the bank is risk averse and is unlikely to approve any financing plan where environmental problems are unresolved.

12 Proposed measures for environmental enhancement

Whilst environmental mitigation reduces the risk of environmental problems, environmental enhancement includes those types of processes or activities which are likely to benefit or increase the value of the surroundings. In many instances environmental mitigation activities are also environmental enhancing.

13 Corporate environmental policy

This is a written document which states the company's environmental purpose, aims, objectives (qualitative) and targets (quantitative).

14 Environmental concerns associated with the project or its associated properties

This question is asking the sponsor to state what he or she believes are the environmental concerns of the project or its associated properties. In other words, the sponsor is asked to form an opinion about he or she considers are the potential environmental problems of the project or its associated properties.

15 Status of public consultation on the project

Public consultation is important for environmental considerations. Has the public been notified of the development and its potential environmental problems? How have they been informed? Have they been given an opportunity to respond?

1 Description of the role of the bank

In this section, you will need to (concisely) describe the role which you wish the bank to play in this transaction. The major types of roles which the bank can play set out below are not mutually exclusive. In other words, the bank can play more than one role in the same project. The typical roles are:

- 1 **Lender:** The bank loans money to the borrower at a fixed or variable rate of interest for a fixed period of years in form of senior or sub-ordinated (mezzanine) debt.
- 2 **Syndicator** of Loans to Other Lenders: This is where the bank repackages the loan and acts to spread the risk of the project across a number of lenders.
- 3 **Guarantor:** The bank guarantees a certain portion of the project funds. This enables other banks and investors to participate in the funding of the project. Guarantees are an effective mechanism to induce other commercial banks to participate in the project funding.
- 4 **Underwriter:** This is where the bank acts to indemnify parties for the loss incurred by non-performance of the project. In effect, the bank acts as a type of insurer.
- 5 **Equity Investor:** In this case, the bank invests risk capital for which the company has no obligation of repayment in terms of principal and interest, but it may have certain contractual obligations to pay dividends.
- 6 **Financial and investment advisor:** The bank plays a role of advising the client on what types of financing and investment options are open and may be appropriate for the proposed project.

1 Preparing a Financing Plan

2 Objectives

There are six major objectives in creating an optimal financing plan from the perspective of the equity-holders of the project company. The sponsors need to:

- Ensure adequate funds for completion
- Secure lowest cost funds
- Minimize sponsors' credit exposure
- Maximize dividends to sponsors given limits of loan terms and cash flow projections
- Maximize tax benefits of ownership, and
- Obtain optimal regulatory permits.

These objectives are contradictory and therefore, the sponsor needs to negotiate clever trade-offs with the respective counter-parties, i.e. lenders, government agencies and suppliers, purchasers.

The general rule for designing optimal financing plans (that is, financing plans which are most advantageous to the equity holding sponsors) requires that the lowest cost of capital of project financing be obtained. The lowest cost of capital of the project financing is equivalent to the debt maximized as a percentage of total capitalisation and where the amortization schedule (that is, repayments of principal and interest over the life of the loan) matches the timing of the cash flows.

The sponsor needs to calculate the total amount of external funds necessary to complete the project. The funds which are pre-committed to the project need to be taken account. The timing of the draw-downs (that is, withdrawals from the advanced funds or equity capital) are critical to the operations. The maximum feasible debt/equity ratio will need to be negotiated between lenders and equity holders. Much will depend on the expected cash flows, whether there is sufficient cash in early period of the loan to meet both debt service and expected dividends.

One serious risk for international projects is the currency fluctuations. If there are simply two currencies then financial hedges can be set up using swaps, forwards or futures. For multiple currencies, multi-currency facilities can be set up with banks. There are many derivative instruments which can be used to help the sponsor manage the currency risk. However a comprehensive discussion techniques are beyond the scope of this work. In recent history (within the last ten years), importers and exporters have seen US dollar based assets fluctuate more than 50% of their original contracted value against other major currencies. A single day flux of up to 3% in dollar terms is not normally accounted for by the most financial models used by sophisticated Western banks, yet this amount of flux may occur with a high probability at least once within two to five years. The sponsor therefore must choose an appropriate currency risk management strategy very carefully.

A basic requirement by banks is that the expected useful economic life of the project must be longer than the loan period. This is obvious since the bank would not like to be paid after an asset becomes non-performing.

Finally, companies which provide sources of supply or equipment for the project may take equity positions in the project company. This would be one method of reducing the costs of supply or equipment in return for equity stakes which may be worth considerably more than the original supply or equipment contract price.

3 Construction Financing Considerations

Banking Loan Facility

Construction financing in Western countries is normally the domain of banks offering medium-term financing of two to five year facilities.

Syndication

For large project financings, no single bank would be willing or perhaps able to take on all the financial risk of the project. The lead manager bank or lead syndicator will look to having a consortium of banks agree to take individual smaller exposures which are then aggregated into a syndicated loan facility which is administered by an administrating bank. If the syndicate of banks cannot be found then the project will not move forward. However, with strong (that is, AAA rated banks), there is usually less difficulties in obtaining a syndicate.

Sponsors' Loan to Project Company

It is also possibly tax advantageous in some jurisdictions for the sponsors to make direct loans to the project company. Interest payments are deductible and in terms of priority of payments in case of the project company's default to outside creditors, the holders of loans stand at a higher priority to receive repayment of principal and interest unpaid than equity holders.

4 Long Term Financing (Take Out Financing)

After the construction period and after the construction loan has been paid, long-term financing is usually sought from financial institutions such as insurance companies and pension funds. However, it is important to note that these investors are unlikely to commit more than two years in advance of takedown (that is, use of the loan funds). These investors are very conservative and would be reluctant to commit permanent funds for new technology without having written assurance and verifiable evidence that all the needed funding commitments have been obtained.

4.1 Maximum Feasible Debt/Equity Ratios

The maximum feasible debt/equity ratio is a question of determining what is the most appropriate way of sharing the financial and investment risks to a project. On one extreme, a pure equity deal is the simplest since it means that the equity holder will take all of the profit from the project. On the other extreme, a pure debt deal means that the financial institutions involved would look to payment only from the project. The debt/equity ratio will be adjusted between these two extremes in order to balance out the risks on a shared basis. For example, the equity capital portion may be drawn-down first as part payment towards construction (early phase of the project) but with the knowledge debt would soon follow. As soon as the project begins to pay-off, the debt service is first paid off and then dividends will be paid to satisfy the equity holders. The dividend payments from this investment may be appreciably higher than other types of investments of a similar character reflecting the nature of the risk.

4.2 Timing of Drawdowns

The timing of the drawdowns should be calibrated so that there is just sufficient funds to carry out the project. Excess funds will be paid for in terms of interest and it will always be cheaper from a financial perspective to have only just enough funds for construction, operation and maintenance.

4.3 Expected Cash Flow Projections

The expected cash flow projections were discussed extensively above in the commentary to the Cash Flow Statement in the Business Plan Form. Cash inflows should match cash outflows as closely as possible during the construction phases. The net present value (which is determined by the total of the cash inflows minus cash outflows) is the value of the project for obtaining bonds or other types of financing in the international capital markets.

4.4 Currency Exposure of Project Revenues and Costs

Since the currency exposure of project revenues and costs could greatly affect the profitability of the project, it is important that hedging provisions be in place as a condition to entering into the financing arrangements. Currency exposure may be hedged by using exchange traded futures and options contracts or more usually for large construction projects, they are arranged as part of the package arranged by the lead financial institution to the project. It is in the bank's best interests that the project does not suffer defeat because of currency fluctuations. If project revenues or costs depend on imports or exports, then the project company is exposed to **transaction risk**. For example, equipment purchase abroad may be deliverable after six months. If the equipment is to be paid in non-local currency then a weakening of the local currency will mean that the equipment will become more expensive to the purchaser. To hedge against this risk, the purchaser may use derivative instruments such as forwards, futures or over-the-counter instruments offered by banks.

4.5 Expected Useful Economic Life of the Project

The expected useful economic life of the project should be longer than the period required to pay off the loan. It is illogical to have a project where the loan will not be paid off when the useful economic life of the project is not long enough to pay all the debt service. Where decommissioning costs are concerned, it is important to take into account the decommissioning costs and who shall the responsibility to pay for them in the future.

4.6 Sources of Supply and Equipment for the Project

Sources of supply and equipment for the project may either be local or non-local and the attendant risks to supply and equipment need to be actively managed. The banks will look to the project company to reduce the supply risk by considering and securing arrangements for alternatives to the supply and equipment.

4.6.1 Construction Financing Sources

The major forms for construction finance include: (1) bank loans; (2) syndication and (3) direct loans to project company by sponsors.

4.6.2 Bank Loans

Bank loans are obtained by the applicant making contact with the appropriate lending officer. For large size loans, it is appropriate to contact the highest level executives of the bank. The applicant works closely with the lending officer to obtain the bank's lending criteria and makes a formal

written application for funds. The subject of the formal application is described above in the business plan form.

4.6.3 *Syndication*

Syndication is a process whereby a lead financial institution (such as an investment bank) promotes the company's request for funds amongst a group of other financial institutions (commercial banks, insurance companies and pension funds). The financial institutions which participate in offering funding to the company are called a "syndicate". Syndication is a way of sharing the risks amongst institutions.

4.6.4 *Direct Loans to Project Companies by Sponsors*

The sponsors to a project may lend funds directly to the project company. From the sponsor's point of view, this might be a more tax efficient way of structuring the transaction.

4.7 Long Term Financing

The long term financing of a project is necessary when the construction is complete and operational and maintenance expenses are required for the continued life of the project. Long-term financing arrangements in the United States for example are usually done through insurance companies and pension funds where there is a need to match long-term liabilities against long-term assets. This form of long term financing is usually done through private placements.

4.7.1 *Private Placements*

Private placements are defined as the selling of securities to a well-defined group of financial institutions. In the United States where the Security and Exchange Regulations prohibit the sell of securities without detailed formal disclosures, private placements are considered an exception to the burdensome rules of registration. The main point for Russian projects is that large Western insurance companies and pension funds would be potential candidates for long term funding.

4.7.2 *Equity Kickers*

Another form of financing which may be used to establish a higher-level incentive for lenders to offer them "equity kickers", that is, options to convert their debt or a portion thereof into equity. For this option right, the cost to the borrower is reduced thereby making the borrowing costs lower in the early years. If, however, at the time when the option right takes effect, the shares to the company have not reached a price where exercise of the option would make profit then the issuer (borrower) may be liable for a larger payment towards debt service. In the West, equity kickers such as convertible bonds have been popular amongst listed companies with strong growth prospects.

4.8 With-holding Tax

The issue of with-holding tax is simply a matter of tax efficiency. The total cost of issuing bonds in a jurisdiction which does not have with-holding tax is less than issuing the same bonds in a jurisdiction which has with-holding tax. Investment banks are especially careful to structure the transaction to minimize unnecessary costs.

4.9 Estimate of the Project's Borrowing Capacity

It is critical to drawing up a proper financial analysis of the project that an estimate be done of the project's maximum borrowing capacity. In effect, the project's cash flows need to be estimated without any borrowed funds and then compared to the project's cash flows with borrowed funds.

4.9.1 *Assume Full Drawdown upon Project Completion*

One way of estimating the project's borrowing capacity is to assume full drawdown of the loan amount upon project completion.

4.9.2 *Assume Periodic Loan Drawdowns*

The other way of estimating the project's borrowing capacity is to assume periodic loan drawdowns as they may be necessary prior to project completion. The more precise these periodic drawdowns are in relation to the actual requirements for construction, the more cost effective the borrowing will be.

4.10 Annual Coverage Tests

Banks will normally use an annual coverage ratio to test the adequacy of the project's projected cash flows to meet debt service.

4.10.1 *Interest Coverage Ratio*

The interest coverage ratio is defined as earnings before interest and income taxes divided by interest expense. This measures the number of times the income available to pay interest charges covers the firm's interest expense.

4.10.2 *Fixed Charge Coverage*

In the United States, the Securities and Exchange Commission prefers to take into account the lease payments which contain an interest component. Thus, the fixed charge coverage ratio is equal to earnings before interest and income taxes plus one-third of rentals divided by the sum of interest expenses plus one-third of rentals. The one-third of rentals approximates the interest component of total rental expense. However, where the exact number is known then that figure should be used instead. In the United States, the earnings before interest and income taxes is equal to net income before (1) income taxes, (2) extraordinary items, (3) income (loss) from discontinued operations, and (4) minority interest plus (5) interest expense net of capitalized interest minus (6) equity in undistributed earnings of nonconsolidated subsidiaries. We note that the capitalized interest is excluded from the earnings before interest calculation unless the company is a regulated utility company, which will recover the capitalized interest through future customer charges.

4.10.3 *Debt Service Coverage*

The debt service coverage ratio is similar to the interest coverage ratio except that it includes repayments of principal. Thus, the debt service coverage ratio is equal to earnings before interest and income taxes divided by the sum of interest expense and principal repayment.

5 Introduction

The financing plan sets out how the transaction costs identified in **Section 6** will be met. Normally, the bank will be only one of several sources of financing. In fact, the bank will require the sponsor both to invest in the equity of the project and to identify other potential sources of financing. In the case where the project involves the expansion of an existing facility, the bank may be prepared to finance the project itself provided the bank's exposure in the company remains within 35 per cent of the long-term capitalisation of the company.

Why does the bank require other investors to co-finance the project?

- Risk Sharing: the bank has an interest to reduce its risks and at the same time to see that entities with direct experience of the business are willing to risk their money in support of the project as a worthwhile venture.
- Additionality: The bank seeks to encourage other financing entities by having them participate in projects either through loans or through equity.

If the sponsor is experiencing difficulty in attracting other financing, especially debt, it is advisable to contact the bank at an early stage. The bank may be able to offer assistance in attracting other lending institutions once the financing structure has been agreed. Commentary on the Financing Plan form is as follows:

6 Current and Required Sources of Finance

The purpose of this paragraph is to present the current and required sources of finance. The total Financing Required is simply the Total Current Sources (A) less the Total Project Costs (B).

The column entitled "Financing Source" includes major types of finance. They are described as follows:

- Sponsor's Own Resources/Equity: The bank will require cash of at least 20% of the project costs. The bank is looking to see its own risk minimised and may look to the sponsor for further cash injections. The valuation of the in-kind contributions should be the actual current market value (re-sale value) and not historical costs.
- Supplier: the supplier may extend credit for the purchase of necessary materials.
- Local loans: for example, these loans may come from local banks or consumer credit institutions.
- Foreign loans: these generally include loans from international financial institutions such as the World Bank, the EBRD and international commercial banks in form of senior and/or mezzanine debt.
- Foreign equity: cash from other investors.
- Others: these may be grants, cash contributions or new financial instruments which are combination of debt and equity, such as convertible bonds.

The layout of the financing plan should be described as in the table below:

Financing Source	Financing Plan (EURO Million)			
	Local	Foreign	Total	% of Total
<i>Debt</i>				
a				
b				
c				
<i>Equity</i>				
a				
b				
c				
Total Project Financing				

The object of the above table is to identify the major financial contributors to the project and its purpose is to help the bank assess the quality and adequacy of the financing.

7 Type of Financing Required

The sponsor should discuss the possibilities with the bank directly. Note that the total of the type of financing required stated in this paragraph should match the total financing required stated under paragraph 2.

1 Introduction

This section focuses on the cash-flow projections of the project. We will describe cash-flow projections and explain how cash-flow is related to the financial viability of the project.

In this section, the proposer's principal aim is to describe the financial viability of the project. This section assumes that the proposer is thoroughly acquainted with the principles stated in **Chapter 4** on the financial economics of energy, renewable energy and energy and has a grasp of how to carry out Net Present Value (NPV) calculations. Here the emphasis is on the concept of cash flow, how it is determined and why it is important.

As a preliminary consideration, it is important to note that the project to be implemented by the proposer will be either:

- a stand-alone project; or
- a corporate finance project.

A stand-alone project will require the creation of a special purpose company. In this situation, the bank will analyse the cash-flows of the proposed new company which does not yet exist. In the corporate finance situation, the bank will analyse the financial statements of the existing company with and without the cash-flows brought about by the project.

In either case the bank's major concern is that the cash flow from the project be amply sufficient to cover the total debt service (all payments of interest and balance of the loan). The strength of the cash flow indicates the financial viability of the project.

Investment in the capital project may have company-wide cash flow implications. There is the danger that those involved in forecasting cash-flows may not realise how the project affects other parts of the business. The proposer should therefore carefully consider whether there are any additional cash-flows associated with the investment decision. For example, the decision to invest in refurbished or new energy equipment and/or technology may influence the quantity and quality of the product, potentially increasing sales and working capital requirements.

2 Definition of Operating Cash-flow

Cash-flow generated by an investment project is the difference between the money coming in and going out of the project. Cash-flow should not be confused with accounting profits which include some cash-flow items and exclude some others and are reduced by depreciation which is not cash-flow at all. The cash-flow indicates whether the investment is worthwhile. The timing of payments is very important to the value of the project. Net cash-flows are a measure of the cash that comes into the investment and the cash that goes out. Depreciation is ignored because the capital outlay is already accounted for in the first year(s) of the investment project. And interest charges are ignored because they are taken into account by the discount rate that is used to discount the cash-flows.

There are two other major reasons why cash-flow from an investment does not equal accounting profit. First, the tax is usually payable in arrears but is deducted from the profit in the year that they are incurred. Secondly, the income statement does not take into account working capital outlay.

The differences between cash-flows and accounting profit are set out below:

Cash-flows versus Accounting Profit

	Cash-flows	Accounting profit
Revenues	When cash comes in	When sale occurs
Operating expenses	When cash goes out	When expenses occurs
Depreciation	Not included	Included in Income statement added back for tax accounts
Capital allowances	Tax shield included as cash inflow	Included in tax accounts
Taxes	When tax is paid (time lag)	Recognised when tax incurred

There are two main ways to derive cash-flows for investment appraisals:

1. From the raw data; and
2. From pro forma financial statements such as the income statement and the balance sheet.

3 Deriving Cash-flows from Raw Data

The ideal situation would be for you to analyse cash-flows without looking at the income statement figures and to examine the cash-flows from the actual operations of the firm.

As you consider your sales forecasts and operating cost forecasts, you may keep in mind to:

- Include a cash outflow when it is likely to leave the business, not when it will be shown as an expense.
- Include a cash inflow from sales when your customers will actually pay, not when the accountants will recognise the sale.
- Include incremental tax, which has occurred due to the incremental cash-flow from the investment. It is important to remember not to include a cash outflow for tax in the year in which the tax expense occurred but rather forecast the tax outflow for the following year when those taxes will actually be paid.

4 Deriving Cash-flows from Projected Financial Statements

Whilst deriving cash-flow from raw data is ideal, it is likely that the data will come to you in the form of an Income Statement and Balance Sheet provided by the company accountant. You can derive a cash-flow statement from accounting data by taking into account the following points:

4.1 Working Capital

By focusing on cash you should automatically include working capital expenses. Working capital is the capital needed by any new project, for example, to pay for inventories or to allow for customers paying on credit, indeed all the expenses required by the investment before cash is received from the customers. The longer the production cycle and the longer your customers will take to pay, the greater your working capital requirements are likely to be.

Working capital requirements can be derived from the balance sheet. The total investment for capital projects can be considerably more than the fixed asset outlay. Normally, a capital project gives rise to increased stocks and debts to support the increase in sales. The increase in working capital (i.e. stocks plus debtors less creditors) brought about by the capital project forms part of the investment outlay, but it is a common error in appraisal to neglect this often crucial component. If the project takes a number of years to reach its full capacity, it is likely that there will be additional working capital requirements in the early years, especially for new products

where the seller may have to tempt purchasers by offering more than usually generous credit terms. It is likely that as the investment increases its sales through its lifetime, there will be additional expenditure on working capital each year. The reason being that the ratio between accounts receivable and accounts payable will remain fairly constant. (If you do not have this information broken down into these components, a reasonable proxy from working capital is current assets minus current liabilities.)

The investment decision implies that the firm ties up fixed and working capital for the life of the project. At the end of the project, whatever is realised is returned to the firm. For fixed assets, this will be scrap or residual value--usually considerably less than the original cost, except in the case of land and some premises. For working capital, the whole figure--less the value of damaged stock and bad debts--is treated as a cash inflow in the final year.

The introduction of new equipment or technology may reduce stock requirements. Here the stock reduction is a positive cash flow in the start year; but you should only include an equivalent negative outflow at the end of the project if it is assumed that the firm will revert to the previous stock levels. A more realistic assumption may be to assume that any replacement would at least maintain existing stock levels, in which case no cash flow for stock in the final year is necessary.

4.2 Interest: Not Included in Cash-flow

Capital projects financed by borrowing requires a series of cash outflows in the form of interest payments. Interest payments, however, should not be included because they relate to the financing rather than the investment decision. Were interest payments to be deducted from the cash flows, it would amount to double counting since the discounting process already considers the cost of capital in the form of the discount rate. To include interest charges as a cash outflow would seriously understate the true NPV.

4.3 Only Fixed Overheads Included in Cash-flow

Only additional fixed overheads incurred as a result of the capital project should be included in the analysis. In the short term, there will often be sufficient factory space to house new equipment without incurring additional overheads, but ultimately some additional fixed costs (for rent, heating and lighting, etc.) will be incurred. Most factories operate an accounting system whereby all costs, including fixed overheads, are charged on some agreed basis to cost centres. Investment in a new process or machine frequently attracts a share of these overheads. While this may be appropriate for accounting purposes, only incremental fixed overheads incurred by the decision should be included in the project analysis.

4.4 Taxation

Taxation for most organisations is a cash-flow. Includes any cash benefits from tax relief on the initial capital expenditure and tax payable on additional cash-flows. Attention should be given to estimating the timing of the tax cash flows. Generally, tax is assumed to be paid one year following the cash-flow upon which it is based, while the tax benefit on capital expenditure occurs one year after the year-end following the end of the accounting period.

4.4.1 Impact of Tax

Tax has two main implications for investment appraisals. On the one hand, if the investment is successful and has a net profit, company taxes will increase. On the other hand, if the investment has involved capital expenditure, the company may be able to claim capital allowances from the government and this will help to reduce its tax burden.

4.4.2 Taxable Profit

In order to calculate the tax, you will need to forecast the profit of the investment. How accurate this estimate needs to be will depend on how large the investment is, and how far the investment proposal has progressed through the review and approval process. Once the incremental cash-flow has been forecast, the payment of taxes should automatically be included in the cash-flow forecasts.

4.4.3 *Timing of tax cash-flows*

In some countries, the actual payment of corporation taxes, payable on the profits of one year, does not normally occur until the following year. For example, if it is currently due six months after the end of the financial year then the company only pays tax one year after the tax expense was incurred.

4.4.4 Example of Deriving Cash-flow from Financial Statements

The following simple example shows how data from the balance sheet and the income statement can be used to derive cash-flow.

Cash-flow from the Forecasted Income and the Balance Sheet (in Euro)

	Year:	0	1	2	3
From the balance sheet:					
Investments		(120,000)			
Stocks		0	80,000	100,000	110,000
Debtors		0	40,000	48,000	46,000
Creditors		0	60,000	72,000	84,000
From the Income statement:					
Revenues		0	400,000	480,000	560,000
Operating profit		0	60,000	96,000	120,000
Depreciation (straight line)		0	(40,000)	(40,000)	(40,000)
Interest charges		0	(10,000)	(8,000)	(3,000)
Tax payable at 33%		0	(3,300)	(15,840)	(25,410)
Net profit		0	6,700	32,160	51,590
Dividends		0	0	(2,000)	(3,000)
Retained profit		0	6,700	38,860	90,450
Add back:					
Depreciation, interest charges & dividends		0	50,000	50,000	46,000
Delayed tax charge*		0	3,300	12,540	9,570 (25,410)
Add investment		(120,000)	0	0	0
Add changes in working capital**		0	(60,000)	(16,000)	4,000 72,000
Cashflows			(6,700)	46,540	59,570 46,590

* This shows the difference between tax payable in one year, and when the tax is actually paid in the next year. So in Year Two tax is paid on Year One's profits (\$3,300) and not on Year Two's profits (\$) and the difference is added back (\$15,840 minus \$3,300 is \$12,540).

** Add in the initial working capital expenses in Year One (stocks plus debtors minus creditors), and then any changes in working capital. Add back the working capital outlay for the investment to Year Three's cash-flow, as those funds are released at the end of the investment.

5 Other Considerations in Cash-flow Analysis

5.1 Sunk Costs

This is money that has already been spent and should have no bearing on whether, if further money was invested, it would gain a good return for shareholders. For example, if you are considering whether to build a technology equipment manufacturing or refurbishment facility of an energy plant on land that you already own, you do not need to include the cost of the original land purchase as part of the investment cost, as that is a sunk cost.

5.2 Incidental Costs and Benefits

All incidental costs and benefits should be included. An example of incidental cost that is often overlooked is the management time involved in the investment project that leads to a temporary

decline in sales elsewhere in the business. That cost (lost sales) should be included as an incidental cost.

5.3 Opportunity Cash Flows

Capital projects often give rise to opportunity cash flows. For example, a company owns land which is not being used for any commercial purpose and intends to build an enterprise on it offering an NPV of Euro 100,000. If the market value of the land is Euro 120,000, this new use imposes an opportunity cost--the cost of denying its sale by building the enterprise. This opportunity cash flow is a fundamental component to the investment decision and should be deducted from the Euro 100,000. The enterprise option is not wealth-creating--other alternatives should be explored, including that of selling the land.

We frequently see opportunity cash flows in replacement decisions. For example, a water treatment facility at a power plant can be replaced by an improved model costing Euro 5 million, which generates cash revenues of Euro 1 million per year for five years when it will have a Euro 500,000 scrap value. The equipment manufacturers are prepared to give an allowance on the existing machine of Euro 1.5 million. The net initial cash outlay is therefore Euro 3.5 million. However, by taking this course of action, the company prevents the existing machine from continuing its intended life when in three years time it would yield a Euro 300,000 scrap value. The scrap value denied three years' from now is the opportunity cost of replacing the existing machine. The cash flows associated with the replacement decision are therefore:

Cash-flow Replacement Decision

Year 0	Net Cost	(EURO 3.5 M)
Years 1-5	Annual Cash Revenues	(EURO 1 M)
Year 3	Opportunity Cash Flow	(EURO 300,000)
Year 5	Scrap Value on new machine	EURO 500,000

6 Conversion into Cash

Improvements in energy equipment and technology may be related to improvements in product quality or delivery time. These improvements can often be converted into cash values. For example, a proposal may be for new machinery. This machinery may lead to improvement in product quality. If you do not include this benefit in the analysis, you may seriously underestimate the value of the project. For example, the quality improvements may lead to cost revenues through the reduction in scrap and wastage, the amount of time on repairing or reworking defective returns and the time it takes to inspect each product. As the quality improves, the company may expect to have less cash outflows from its warranty service since fewer products will need to be repaired within the warranty service period. The increase in quality may also lead to an increase in sales. You will need sufficient information to make informed judgements on how the increased quality will affect cash-flows.

It is very important that you distinguish those improvements from the investments which are quantifiable from those which are difficult to quantify. The bank is interested in seeing those costs and benefits which can be converted into cash. However, you will need to make sure that you can show clearly how you derived these monetary values.

7 Strategic Options

Investments of a strategic nature often offers hidden benefits beyond that found in their underlying cash flows. These hidden benefits may arise during the life of a project, but not be quantifiable, such as the greater production flexibility from the introduction of advanced manufacturing technology. Alternatively, the actual investment could open up the possibility of other wealth-creating opportunities. These opportunities could be called strategic options including:

- Entry into new markets
- Developing follow-up products and
- Improving existing practices.

The introduction of new energy industry manufacturing technology may provide the right opportunity to introduce new management practices such as just-in-time procedures. Investment in new energy technology may also give rise to entry into other markets (conversion).

The true NPV is therefore the sum of the project NPV normally calculated and the value of strategic options.

8 Checklist of Practical Tips

First, you need to decide what is the appropriate alternative to the investment project. Are there any opportunity costs which should be included in the analysis?

Second, you may list all the tangible and intangible costs and benefits of the project that are incremental to existing expenditure. Can the intangible costs and benefits be converted in to monetary values in a way that is acceptable to the bank? You may need to focus on the incremental costs and benefits that are most relevant to the bank. Any other quantifiable benefits should be considered extra ammunition but not core to your central argument.

Include only future, incremental cash flows relating to the investment decision and its consequences. This implies that:

1. Only additional fixed overheads incurred are included.
2. Depreciation (a non-cash item) is excluded.
3. Sunk (or past) costs are not relevant.
4. Interest charges are financing (not investment) cash flows and therefore excluded.
5. Opportunity costs (e.g. the opportunity to rent or sell premises if the proposal is not acceptable) are included.

Profit is not so relevant as cash flow in decision analysis.

- * Replacement decision analysis examines the change in cash flows resulting from the decision to replace an existing asset with a new asset.

9 Commentary on the Cash-flow Projections

The following is a commentary on the Cash-flow Projections in the Business Plan Form.

9.1 Operating Profit

9.1.1 *Total Turnover*

This includes any and all sales revenue connected to the project.

9.1.2 *Raw material*

This has been stated in the section on Transaction Costs.

9.1.3 *Other direct operating costs*

This has also been stated in the section on transaction costs.

9.1.4 *Gross profit*

This is the addition of the turnover less the costs of raw material and other direct costs.

9.1.5 *Indirect costs*

These are incremental costs associated with the project such as:

- 1 Sales and marketing
- 2 Utilities and maintenance
- 3 Overheads
- 4 Other
- 5 Total Operating Expenses (excluding depreciation). This is the total of lines 1 through 4.

9.1.6 *Operating profit (excluding depreciation)*

This is gross profit less total operating expenses.

9.2 Working capital

See the discussion above at Working Capital. Changes in working capital are taken account by the next three lines.

9.2.1 *Decrease (increase) in stock*

A decrease in stock (inventory) means that there is a net inflow of cash to the firm while an increase in stock is a net outflow of cash.

9.2.2 *Decrease (increase) in debtors*

A decrease in debtors (less number of outstanding debts owed to the firm) means a net inflow of cash to the firm while an increase in debtors is a net outflow of cash.

9.2.3 *Decrease (Increase) in creditors*

A decrease in creditors (a lower amount of debt to the firm) is a net inflow of cash while an increase in creditors is a net outflow of cash.

9.2.4 *Operating Cash Flow*

This is the sum of the operating profits, depreciation, decrease (or increase) in stock, decrease (or increase) in debtors and increase (decrease) in creditors.

9.3 Taxation

See discussion above in Taxation. The main point is that taxes appear in the cash-flow statement when they are actually paid.

9.4 Capital Expenditures

This is the expenditure on fixed assets which have an economic life of more than one year.

9.5 Free cash-flow (pre-finance)

This is the cash not retained and reinvested in the business. The free cash-flow is the operating cash flow less tax paid and less capital expenditures. The capital expenditures should be clear from your analysis conducted in Section 6: Transaction Costs and Timetable.

9.6 Servicing of Finance

9.6.1 *Interest paid*

This is the interest paid on all long term loans.

9.6.2 *Bank fees paid*

These are fees paid to the bank for obtaining the loan.

9.6.3 *Net cash-flow before financing*

The net cash-flow before financing is equal to the free cash-flow less the total cost of servicing of finance.

9.7 Financing

9.7.1 *Issue (redemption) of ordinary share capital*

Cash inflow from the issue of an equity stake in the firm. Cash outflow from the redemption of equity/share capital in the firm.

9.7.2 *Others: long term loan receipt/(repayment)*

These are cash outflows from the repayments of long term loans to other banks, or cash inflows from loans negotiated with other banks.

9.7.3 *Bank: loan (repayment)*

These are cash outflows generated for the repayments of the loan to the bank.

9.7.4 *Bank: loan requirement*

This is the money to be received from the bank and should be equivalent to the capital expenditure on the project in the period concerned.

9.7.5 *Short term loan receipt/(repayment)*

These are any repayments to be made in respect of short term loan obligations or cash inflows from short term loans negotiated and received.

9.7.6 *Net cash-flow after financing*

The net cash-flow after financing is the net cash-flow before financing less the amount paid for financing.

9.8 Ratios

9.8.1 Gross Profit Margin

Total turnover (total revenues) less total direct operating costs divided by total turnover.

9.8.2 Net Profit Margin

Net profit before tax divided by total turnover.

9.8.3 Return on Equity

Net profit before tax divided by shareholder's equity. (See Balance Sheet in Section 12 Appendix Pro-forma Financial Statements.)

9.8.4 9.8.4 Current Ratio

Current assets divided by current liabilities. (See Balance Sheet in the Appendix Pro-forma Financial Statements.)

9.8.5 Acid Test (Quick Ratio)

Current assets less stocks divided by current liabilities. This measures the ability of the firm to meet its short-term liabilities by generating cash-flows from its most liquid assets.

9.8.6 Free Cash-flow to Debt Service Ratio

This is the free cash-flow divided by the interest paid and the total long term loan repayment. This measures the firm's ability to pay for its long term loan out of the cash-flow from the project.

Cash Flow Summary	Yr (2)	Yr (1)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Total Turnover	0	0	0	0	0	0	0	0	0	0	0
Direct costs											
Raw material	0	0	0	0	0	0	0	0	0	0	0
Other direct operating costs	0	0	0	0	0	0	0	0	0	0	0
Gross profit	0	0	0	0	0	0	0	0	0	0	0
Indirect costs											
Sales and marketing	0	0	0	0	0	0	0	0	0	0	0
Utilities and maintenance	0	0	0	0	0	0	0	0	0	0	0
Overheads	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Total Operating Expenses (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Operating profit (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Working capital											
Decrease (increase) in stock											
Decrease (increase) in debtors											
Decrease (increase) in creditors											
Taxation	0	0	0	0	0	0	0	0	0	0	0
Capital expenditures											
Free cashflow (pre-finance)	0	0	0	0	0	0	0	0	0	0	0
Servicing of Finance											
Interest paid	0	0	0	0	0	0	0	0	0	0	0
Bank fees paid	0	0	0	0	0	0	0	0	0	0	0
Net cashflow before financing	0	0	0	0	0	0	0	0	0	0	0
Financing											
Issue/(redemption) of ordinary share capital											
Other long term loan receipt/(repayment)											
Bank: loan (repayment)											
Bank: loan requirement											
Short term loan receipt/(repayment)											
Net cashflow after financing	0	0	0	0	0	0	0	0	0	0	0

Pro-Forma Financial Statements

1 Introduction

The Pro-forma Financial Statements consist of the Income Statement (Profit and Loss Account), the Balance Sheet, Cash-flow and Financial Ratios. Please note that the information provided in these statements may have already been stated in the Section 6: Transaction Costs and Timetable and in **Section 11** Cash-flow Projections. In this commentary, a brief explanation of each of the items in the financial statements is given. For the sake of clarity, an example from a real-life project is presented at the end of this commentary so that the reader can see how the calculations of various items interrelate. (Please note that the name of the project and the actual numbers have been altered in order to preserve and protect the confidentiality of the parties concerned.) In general, there are three stages in preparing the pro-forma financial statements:

2 Stage 1 Pre-finance

In this stage, you present the financial condition of the company without any consideration of long term finance.

3 Stage 2 With Finance

In this stage, you show the financial condition of the company with finance.

4 Stage 3 Differential between Stage 1 and Stage 2

Finally, in the last stage, you show the difference between the projections set out in Stage 1 and the projections in Stage 2.

5 Forecasted Income Statement

The following is a commentary of the Pro-forma Financial Statements in the Business Plan Form.

Forecasted Income Statement Including bank Loan (in thousand USD/Euro). For items 1 through 13, please refer to the Commentary on Operating Profit.

- 1 Total turnover
- 2 Raw material
- 3 Other Direct Operating Costs
- 4 Gross Profit
- 5 Indirect Costs
- 6 Sales & Marketing
- 7 Utilities & Maintenance
- 8 Overheads
- 9 Other
- 10 Total Operating Expenses (excl. depreciation)
- 11 Operating Profit (excl. depreciation)
- 12 Depreciation

This is an accounting measure of the declining value of an asset over the lifetime of the asset. Please note that depreciation must be "neutralised" in the Cash-flow statement.

- 13 Operating Profit

Operating profit is equal to the amount of Operating Profit excluding depreciation plus the amount of depreciation. This figure for Operating Profits is equal to line 1 of the Forecasted Cash-flow below.

14 Interest Expense

This is the interest expense on the loan sought.

15 Bank fees

These are fees to be paid to the bank.

16 Net Profit Before Tax

Net Profit before Tax is equal to the Operating Profit less the Interest Expense and bank Fees.

17 Taxation

This is the expected tax to be paid.

18 Net Profit After Tax

This is the Net Profit before Tax less the Taxation.

Profit and Loss Summary	Yr (2)	Yr (1)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Total Turnover											
Direct costs											
Raw material											
Other direct operating costs											
Gross profit	0	0	0	0	0	0	0	0	0	0	0
Indirect costs											
Sales and marketing											
Utilities and maintenance											
Overheads											
Other											
Total Operating Expenses (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Operating profit (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Depreciation											
Operating profit (PBIT)	0	0	0	0	0	0	0	0	0	0	0
Servicing of Finance											
Interest paid											
Bank fees paid											
Net Profit Before Tax	0	0	0	0	0	0	0	0	0	0	0
Taxation											
Net Profit After Tax	0	0	0	0	0	0	0	0	0	0	0

6 Forecasted Balance Sheet

Forecasted Balance Sheet including bank Loan (in thousand Euro).

6.1 Introduction

The balance sheet is designed to illustrate a company's financial position (that is, the assets owned, shareholders' funds and liabilities owed) at a specific point in time. The balance sheet relationship between assets, shareholders' funds and liabilities can be expressed as:

$$\text{Assets} = \text{Shareholder's funds} + \text{Liabilities.}$$

Another way of saying the same thing is:

$$\text{Total Assets} = \text{Total capital} + \text{Liabilities.}$$

In the format below, the long term debt owed to the bank is clearly set out as part of the overall relationship:

$$\text{Total Assets} = \text{Shareholder's Equity} + \text{Long Term Debt} + \text{Current Liabilities.}$$

6.2 Assets

1. Tangible Assets

The tangible assets are whatever "you can kick". In other words, they are physical items.

2. Accumulated Depreciation

This the depreciation per year added consecutively for each year.

3. Net Book Value
This the value of the Tangible Assets less the Accumulated Depreciation.
4. Stocks
These are short term items in inventory that are expected to be sold within a year.
5. Debtors
These are debtors to the firm which are expected to pay the firm within a year.
6. Cash
These are liquid assets that can be turned immediately into cash.
7. Current Assets
The Current Assets is equal to the total of the Stocks, Debtors and Cash together.
8. Total Assets
The Total Assets is equal to the total of the Net Book Value and the Current Assets.

6.3 Liabilities

9. Called up share capital
This is the cash which shareholders have paid in to the firm.
10. Profit & Loss account
This is the amount of profits (or loss) which was not distributed as dividends.
11. Shareholder's equity
This is difference between the amount of the Called up Share Capital and the Profit and Loss Account.
12. Long Term Debt
This is amount of payment on long term debt.
13. Trade creditors
This is the short term debt owed to suppliers and others who are expected to be paid within a year.
14. Short term debt
These are debts due for payment within a year.
15. Current Liabilities
This is the total of Trade Creditors and Short term Debt.
16. Total Liabilities
This is equal to the Shareholder's Equity plus the Long Term Debt and the Current Liabilities.

Balance Sheet	Yr (2)	Yr (1)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Assets											
Tangible Assets											
Accumulated Depreciation											
Net Book Value	0	0	0	0	0	0	0	0	0	0	0
Stocks											
Debtors											
Cash											
Current Assets	0	0	0	0	0	0	0	0	0	0	0
Total Assets	0	0	0	0	0	0	0	0	0	0	0
Liabilities											
Called up share capital											
Profit & Loss Account											
Shareholder's equity	0	0	0	0	0	0	0	0	0	0	0
Long Term Debt											
Trade creditors											
Short term debt											
Current Liabilities	0	0	0	0	0	0	0	0	0	0	0
Total Liabilities	0	0	0	0	0	0	0	0	0	0	0

7 Forecasted Cash Flow

Forecasted Cash Flow including bank Loan (in thousand USD). Please note that the definition of the following terms are found in Commentary to Cash-flow Projections.

1. Operating Profits

2. Add Back Depreciation
3. Decrease (Increase) in stock
4. Decreases (Increase) in debtors
5. Increase (Decrease) in creditors
6. Operating Cash Flow
7. Taxation Paid
8. Capital Expenditures
9. Free Cash Flow
10. Servicing of Finance
11. Interest Paid
12. Bank Fees Paid
13. Dividends Paid
14. Net Cash Flow before Financing
15. Financing
16. Issue of ordinary share capital
17. Others long term loan payment
18. Bank long term repayment
19. Long term loan requirement
20. Short term loan
21. Net cash flow from financing

Cash Flow Summary	Yr (2)	Yr (1)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Total Turnover	0	0	0	0	0	0	0	0	0	0	0
Direct costs											
Raw material	0	0	0	0	0	0	0	0	0	0	0
Other direct operating costs	0	0	0	0	0	0	0	0	0	0	0
Gross profit	0	0	0	0	0	0	0	0	0	0	0
Indirect costs											
Sales and marketing	0	0	0	0	0	0	0	0	0	0	0
Utilities and maintenance	0	0	0	0	0	0	0	0	0	0	0
Overheads	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Total Operating Expenses (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Operating profit (excluding depreciation)	0	0	0	0	0	0	0	0	0	0	0
Working capital											
Decrease (increase) in stock											
Decrease (increase) in debtors											
Decrease (increase) in creditors											
Taxation	0	0	0	0	0	0	0	0	0	0	0
Capital expenditures											
Free cashflow (pre-finance)	0	0	0	0	0	0	0	0	0	0	0
Servicing of Finance											
Interest paid	0	0	0	0	0	0	0	0	0	0	0
Bank fees paid	0	0	0	0	0	0	0	0	0	0	0
Net cashflow before financing	0	0	0	0	0	0	0	0	0	0	0
Financing											
Issue/(redemption) of ordinary share capital											
Other long term loan receipt/(repayment)											
Bank: loan (repayment)											
Bank: loan requirement											
Short term loan receipt/(repayment)											
Net cashflow after financing	0	0	0	0	0	0	0	0	0	0	0

8 Forecasted Ratios

Forecasted Ratios including bank Loan (in thousand Euro). Please refer to the definitions of the following ratios in the Commentary to Cash-flow Projections.

1. Gross Profit margin
2. Net Profit Margin
3. Return on Equity
4. Current Ratio
5. Acid Test (Quick Ratio)
6. Gearing
7. Cash-flow to Debt Service Ratio

Ratios	Yr (2)	Yr (1)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8
Gross Profit Margin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Net Profit Margin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Return on Equity	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Current Ratio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Acid Test (Quick Ratio)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Free Cashflow to Debt Service Ratio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

9 Financial Modelling

The financial modelling of the project will require an estimate of the total costs, possible contingencies for cost over-runs, capital costs and understanding of the project economics as well as how the ownership structure will be divided amongst the group of equity and debt holders.

9.1 Estimating Total Costs

The total project costs should include all of the factors included in the business plan form. These costs should be based on historical data or market comparisons.

9.2 Contingency for Cost Over-runs

Since no plan is ever executed absolutely perfectly, it is important to estimate the variance of the total costs and the need for a contingency fund which can be tapped in case over-runs occur. In the United States, the cost of untapped but committed funds is about 1.25 to 1.50 percent.

9.3 Capital Costs

The capital costs of the project are described in the business plan form. The capital costs are those expenditures which are necessary to make the project fully functioning.

9.4 Ownership Structure

The ownership structure is discussed in the business plan form. Theoretically, the ownership structure may vary from pure equity to pure debt. For reasons of risk-sharing, neither extreme point is optimal for financing purposes. The ownership structure is *always* a mixture of debt and equity.

9.5 Project Economics

The project economics need to take into account the interrelationships between input-supply and output-production. Therefore data supporting future projections need to be supplied and may be used to support assumptions made of the major variables for project economics.

9.6 Cash-Flow Projections

The cash-flow projections are discussed in the business plan form. The cash-flow projections are the central and fundamental core of the financial proposal. If for any reason the cash-flow projections are unreasonable, objectionable or lacking in credibility then the project proposal will fail. Therefore, there should be factual data to substantiate each item of the cash-flow projection.

9.7 Currency Assumptions and Risk

The project's profitability if dependent on foreign markets for supply or sale will be subject to currency fluctuations. Details of the reasons for selecting a particular exchange rate need to be made explicit. Further, an analysis of the risk (i.e. variance) of the foreign exchange rate needs to be taken into account.

9.8 The Project's Debt Capacity

The project's debt capacity can be reduced to some rather simple formulas with ten or so variables. However, these formulas are dependent on the project company having a complete set of accounts and that the accounting procedures are in a Western format.

9.9 Interest Rate Risk

Aside from currency risk, every financial transaction is exposed to interest rate risk. In the international financial markets, interest rate risk can be managed using a wide variety of instruments including interest rate swaps, forward rate agreements (i.e., profiting from an expectation that interest rates will rise), inverse forward rate agreements (i.e., profiting from an expectation that interest rates will decrease) and swaptions (i.e., options to purchase swaps in the future). Since it is likely that the project company will be dealing with hard currency (that is, for example Euro or US Dollars equivalents), interest rate planning will be an important aspect of the financial management of the project.

9.10 Rates of Return for Different Investors

Different types of investors to the project will expect different rates of return according to the risk these investors take.

9.11 Passive Equity Investors

The passive equity investor will expect a rate of return that is equivalent to the rate of return expected from a similar investment. One way of arriving at this rate of return is to first define the baseline rate of return, which is the so-called “riskless” bond--that is, the rate of return for the sovereign bond in which the investment is located. Any investment within this particular sovereignty should receive a rate of return that is higher than the riskless rate. If for example investors are earning 11 percent on riskless government bonds then public utility bonds should pay more than 11 percent.

9.12 The Sponsor’s Equity

The sponsor’s equity also looks to earn a return which is equivalent to the risk class of like investments. The procedure applied above for passive equity investors can be used to determine the rate of return expected by sponsor’s equity.

9.13 Sensitivity Analysis

Sensitivity analysis is used in a variety of situations to help determine the efficacy of the investment. In its crudest form, it produces a graph of the break-even point for a particular variable. The question to be answered in sensitivity analysis is, “how sensitive is the project to a particular variable?”

Checklist of supporting documents typically required as appendices to a Project Agreement.

1. Project description and specification
2. Necessary licenses, permits and approvals
3. Description of and rights of way for the project
4. Preliminary design criteria
5. Procedures for government to approve the project's company's proposal for design changes
6. Procedures for government to request design changes and additional work
7. Environmental impact assessment and environmental management system
8. Quality management system
9. Safety certification system
10. Programme and procedures for testing
11. Project operation parameters
12. Operation and maintenance criteria
13. Tariff or toll rates and tariff or toll revision formulae
14. Specifications for tariff or toll collection system
15. Training programme
16. List of initial shareholders and percentage interests
17. Insurance agreements
18. List of pre-approved contracts
19. Rights and obligations of the parties upon termination
20. Form of bonds
21. Form of guarantees
22. Overseeing and monitoring rights of the government
23. Form of legal opinion of counsel for project company
24. Form of legal opinion of counsel for government (various relevant ministries)

References

Brealey Richard A. And Myers Stewart C. (1996) **Principal of Corporate Finance**, McGraw-Hill

Eastop, T.D. and Croft D.R. (1990) **Energy Efficiency for Engineers and Technologists**, Longman Group, Burnt Mill, Harlow, Essex CM20 2JE, U.K.

Energy Efficiency, Developing Nations, and Eastern Europe, p. 22. A report to the U.S. Working Group, on Global Energy Efficiency, IIEC, June 1991.

European Bank for Reconstruction and Development (1992) **Environmental Procedures**, EBRD, London.

ETSU and Cheriton Technology Management Limited (1993) **Investment Appraisal for Industrial Energy Efficiency, Guide 69**, ETSU, Harwell, Oxfordshire OX1 0RA.

Haddock, Greg (May 1995) "Financing Renewable Energy Projects" in **Innovative Financing Schemes for Energy and Environmental Technology and Services**, Proceedings of Workshop April 11, 1995, Luxembourg-Kirchberg, Chamber des Metiers, European Commission, Directorate-General XVII – Energy, p IV-2.

Hobson, P. (1994) "Financing the Pot of Gold" in **World Energy Council Journal**. For copies see The International Institute for Energy Conservation, IIEC-Europe, 1-2 Purley Place, London N1 1QA, Tel: +44 171 704 6737, fax: +44 171 707 8757.

Modigliani, F. And Miller, M.H. "The Cost of Capital, Corporation Finance and the Theory of Investment" in **The American Economic Review**, XLVII (3), 261-297.

Moran, K. (1995) **Investment Appraisal for Non-Financial Managers**, Pitman Publishing: London.

The Results Centre (1993) **Comprehensive Municipal Energy Efficiency**, Profile No 79.

United Nations (1994) **Manual on Business Planning, How to Construct a Business Plan for Energy Efficiency Projects**, Economic Commission for Europe, Geneva.