



Developing a Project Finance Software Package White Paper

This paper describes the key features of a project finance software package and demolishes the widely held idea that a spreadsheet is the only tool for a project finance model

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Introduction

Summary

In this paper we will look at the history of project finance models, the evolution of spreadsheet models, the weaknesses of such models, the alternatives proposed by others and finally the features which a “purpose made” software package must include.

Background

What is Project Finance?

Project finance is variously described as:

“a nonrecourse or limited recourse financing structure in which debt, equity, and credit enhancements are combined for the construction and operation, or refinancing, of a particular facility in a capital-intensive industry in which lenders base credit appraisals on the projected revenues from the operation of the facility, rather than the [value of] the general assets or the credit of the sponsor of the facility, and rely on the assets of the facility, including any revenue producing contracts and other cash flow generated by the facility , as collateral for the debt”¹ or

“The financing of a particular economic unit in which a lender is satisfied to look initially to the cash flows and earnings of that particular unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan”²

Why is a model necessary?

The above definitions have one thing in common, they all include the projected cash flows. Those cash flows can only be determined and analysed if a model is used to calculate the figures. The model will determine such key criteria as the internal rate of return (IRR) and net present value (NPV). More importantly, it will determine the loan cover ratios needed by the lenders to ensure that their loans are secure and show financial returns to the investor and it will be used to carry out the “What if” analyses so important in judging the robustness of the proposed financial structure.

Most loan, franchise and concession agreements will require a model to be used and kept up to date through the life of the project in order to show stakeholders the continuing viability of the project.

History of Modelling

Early project finance models were based on Visicalc and Lotus 1-2-3 which became available in the 1980s. These spreadsheet packages had a limited macro language to reproduce key sequences. When Microsoft initially developed Excel (for the MacIntosh Apple) in the late 1980s they used a more powerful macro language (XLM). It later converted this to VBA (Visual basic for Applications). Today it comes with many advanced features and it is now the most popular spreadsheet for building project finance models.

¹ Scott L Hoffman A Practical Guide to Transactional Project Finance Basic Concepts, Risk Identification and Contractual Considerations 45 BUS. LAW. 181 n.1 (1989)

² Peter K Nevitt Project Financing 3 (1983)

Published literature is full of horror stories

Weaknesses of Spreadsheets

The use of spreadsheets is fraught with dangers which are well recorded in a variety of publications. The following quotes come from a recent publication³

...“end users are putting their companies at risk by setting up spreadsheets without realizing that this demands the discipline of traditional programming.”

...“Sarbanes-Oxley implies managers can’t ignore un-controlled spreadsheets”

...“We nearly always find that modellers have no formal training in good modelling techniques, and that their organizations do not have even the most rudimentary internal modelling standards”

...“Spreadsheets are a powerful modelling language, mainly used by amateur programmers on a diversity of applications which are typically deployed throughout a wide range of different business functions”

Or even the following from another publication:⁴

...“Spreadsheets have been shown to be vulnerable, yet they underpin the operation of the financial system. If the uncontrolled use of spreadsheets continues to occur in highly leveraged markets and companies, it is only a matter of time before another “Black Swan” event occurs, causing catastrophic loss. It is completely within the realms of possibility that a single, large, complex but erroneous spreadsheet could directly cause the accidental loss of a corporation or institution, significantly damaging the City of London’s reputation.”

Numerous authors have published papers on the common errors which creep into spreadsheets.^{5 6}

Weaknesses Addressed

Many companies offer in-house and public training courses to improve the quality of project finance models. In recent years various organizations have developed auditing and other tools to reduce the risks, some generic and others devoted to project finance and PFI/PPP projects. Some of these problems can be mitigated by following well structured guidelines, such as those prepared by the ICAEW.⁷

But in all cases the underlying calculation engine is a spreadsheet.

Lack of alternatives

Alternatives to Spreadsheets

A simple search for the terms “project finance software” and “project finance models” conducted via the Internet as of late 2008 reveals many models but all of them appear to be based on spreadsheets.

³ Stop That Subversive Spreadsheet! 2004, Ray Butler and David Chadwick reporting on formation of EUSPRIG European Spreadsheet Risk Interest group

⁴ The Importance and Criticality of Spreadsheets in the City of London, Grenville J Cole, EUSPRIG

⁵ Spreadsheet Accuracy Theory, S E Cruck, Journal of Information Systems Education Vol 12(2)

⁶ What we Know about Spreadsheet Errors, Prof Raymond Panko, Journal of End User Computing Vol 10, 1998 Revised May 2008

⁷ Spreadsheet Modelling Best Practice 1999 by Nick Read and Jonathan Batson of IBM published by the Institute of Chartered Accountants for England and Wales

Key features:

*Complete and
easy to use*

Basis for a New Software Package

If we were to start with a blank sheet of paper, what would be the key features of such an alternative? We suggest the following two key desirable characteristics:

Complete

The package must incorporate all the variables which determine the project cash flows (some of which are rarely used in a spreadsheet model). So the package should handle many different technologies, legal configurations, funding bases and so on.

There are other considerations which are also important and which we will describe in more detail in this paper.

Easy to Use

The package should have a “wizard type” set up when the user wants to create a new model. Once the wizard has created the structure of the model, the user should find it easy to insert the information into the model through a suitable method such as a series of dialog boxes. He/she should be able to make changes to the units of measurement without having to look up conversion factors and the software should advise of any unusual or unacceptable input data.

*There are
emergent
beneficial side
effects from using
a dedicated
package*

There are side benefits to be gained from using a dedicated and standalone software package such as consistency and reliability. We will draw attention to these as we develop our thoughts in this paper.

We will now describe these two elements in more detail and then look “under the hood” or “bonnet” to see the considerations which go into the choice of a suitable software development platform.

Outline Specification

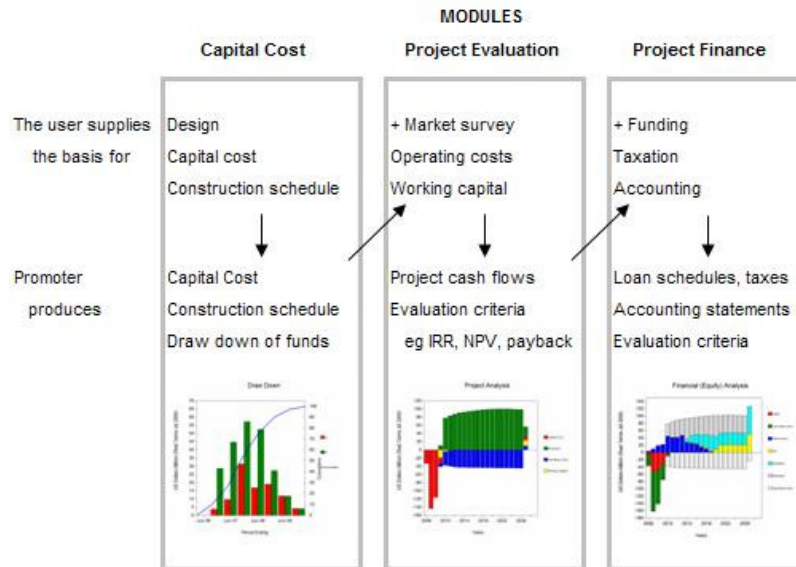
*A complex model
can be simplified
by breaking it
down into three
critical areas*

Configuration

The main output from the package is the Net Present Value (NPV), Internal Rate of Return (IRR), Loan Cover Ratios and other key criteria. There are two sets of criteria, those calculated on the basis of the project cash flows and those based on the equity cash flows. The latter include the effects of funding, taxation and accounting.

Before the user can consider the project financing, the project cash flows must demonstrate that the project is viable (no amount of creative financing can convert a poor project into a viable one). For this he/she needs to know the draw down of funds during the construction phase and the revenues and operating costs during the operating phase. He/she can then consider the funding and fiscal bases.

The above observation suggests that any software package be split into three modules as illustrated below.



Usable in a wide variety of industries

Industries

The following industries frequently use project finance: oil and gas developments, petrochemicals, fertilizers, oil refineries, pulp and paper, transportation (including ports, airports, toll roads), power, mining, infrastructure and telecommunications. The package should handle models for one or more of these industries in some form or another.

Deterministic and stochastic model

Deterministic and Stochastic Models

Most project finance models are deterministic models. The results are based on a single set of input figures using a most likely scenario. The model may include a low and a high case (or scenario) but the results are always the same each time the model is recalculated.

The alternative is a stochastic model. In this case the model sets each relevant input as a random number between pre determined limits before it calculates the cash flows. These limits must be carefully reviewed for the results to be meaningful. A single calculation is not useful by itself for decision making. By repeating the calculation a thousand or more times and keeping a record of the results each time a Monte Carlo analysis may be generated showing a probabilistic element for each factor. The risk assessed figures are the average of the calculated numbers. The package should also calculate confidence levels.

Include all key project criteria

Key Project Evaluation criteria

Different organizations use different criteria when evaluating a project. These criteria include the net present value (NPV), the internal rate of return (IRR), the payback period, the profitability index and the loan cover ratios. It is worth making some observations on these figures.

Any figure must make it clear what it refers to and how it is calculated. The IRR can be calculated on the project and the equity cash flows. It can be calculated on the nominal cash flows and the real cash flows. And it can be calculated with

a deterministic and a stochastic model. The package should calculate it on all these bases. Similar considerations apply to the other criteria.

Note too that different companies calculate the profitability index on different bases.

Capital Cost Module

- **Schedule**

The user should be able to set any date as the start date for the project (that is, the date when the main contract becomes effective). He/she should also be able to set the construction period to any number of days and the software should adapt its display to suit.

Parametric cost estimate capability is useful for optimizing project

- **Parametric Cost Estimate Capability**

In the early phases of the project, it is common practice for the developer to analyse alternative design configurations and plant capacities. Ideally, the package should therefore include suitable routines for calculating the capital cost with differing capacities. In effect, the package should contain a parametric capital cost estimate which produces a rough order of magnitude cost appropriate to the industry. The user should be able to adjust this estimate with the results of a more thorough external estimate if required.

Side benefit: Design routines can be used throughout the operating phase

There are benefits to be obtained from including simple design routines into the software. For instance, in a transportation project, the software may calculate the number of trains (or buses) needed to meet the projected demand at the start of the project. With an increasing demand through the life of the project, the same routines can be used to estimate when additional investments must be made to ensure a constant level of service. The user can specify that a reserve fund is specified to ensure that the operator can make the additional investments without recourse to further outside funding.

Project Evaluation Module

Capability to handle different revenue bases

- **Revenue basis**

In some projects, the price of the product may be negotiated. In others it is subject to market forces. Where negotiated, the formula for the price is typically the sum of two elements, the capital cost and the running costs. Occasionally some of the running costs are reimbursable. Where it is subject to market forces it may be necessary to calculate net back prices from different markets.

- **Cost and Price Projections**

All costs and prices should be accompanied by a corresponding currency and validity date. The validity date may typically be the start of the project, but some figures may be negotiated with a different date. It is safer therefore to ensure that all costs and prices have a corresponding validity date.

The package should calculate the projected prices with the inflation rate appropriate to the currency in which the cost or price is expressed. There should be factors for the partial or total recovery of inflation.

Working capital is too often forgotten in financial models

- **Working Capital**

The working capital is often forgotten in a project finance model. The package should include all current assets and liabilities. In on some projects such as an oil refinery with a large inventory (stock) of both the feed crude oil and the products, the value of the working capital will represent over one quarter of the total investment and it needs to be included in the funding calculations.

Project Finance Module

Beneficial side effect: Ability to set the accounting currency

- **Accounting Currency**

The accounting currency may not necessarily be the same as the currency in which the cash projections are displayed in the model. The accounting currency is usually the local currency (but exceptions can be sometimes negotiated with the host government). This is important because the corporate tax calculations carry the undepreciated assets on the balance sheet forward in the accounting currency, not the display currency. Additionally, the exchange rate may change from year to year, particularly if there is a high local inflation rate.

Failure to take note of the accounting currency produces lower tax calculations when the local inflation rate is high. It is a common mistake in many spreadsheet models. The package must allow the user to set the accounting currency.

Choice of display currencies

- **Display Currency**

Most spreadsheet models display the cash flows in millions of US Dollars, but some do so in the local currency. It would be highly advantageous to display in any suitable currency and in billions, millions, thousands as appropriate. The user should be able to input costs and prices in whatever currency is most appropriate.

- **Bank Accounts**

A project financing inevitably needs a local bank account to handle day to day operating costs, usually in the local currency; and an escrow account usually offshore in a foreign currency, into which the project revenues are paid and from which the main disbursements are made. The user should be able to set the currency of the accounts and any target balances.

Include the capability to handle cash traps and cash sweeps

- **“Cash Traps” (Dividend Policy) and “Cash Sweeps”**

Cash traps are covenants in the loan documentation which restrict the payment of dividends when certain accounting ratios deviate from the planned figures. They effectively constitute a dividend policy. In a given loan there may be one or more cash traps. The ratios may be calculated from the balance sheet or from the cash flows.

Cash sweeps are the use of surplus cash during the operating phase to prepay debt or to provide extra security for lenders instead of paying it out to shareholders.

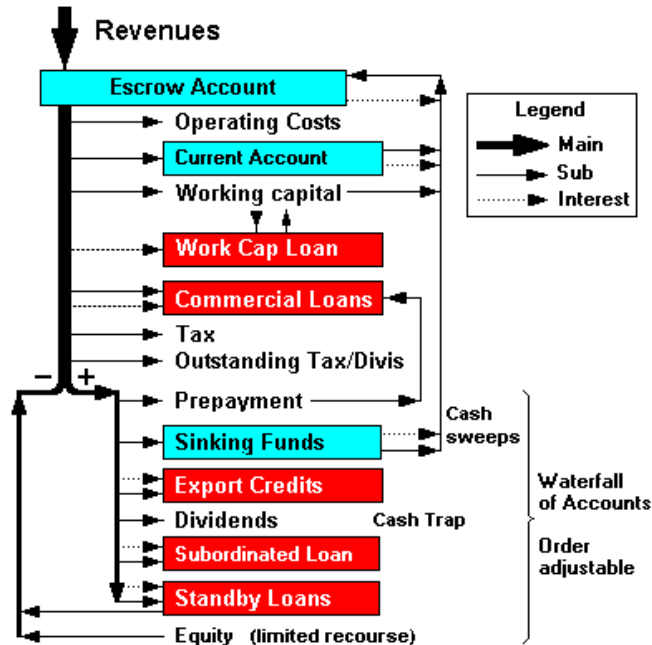
Side benefit: correct calculation of loan restrictions

Loan agreements typically restrict cash flows if the minimum loan (or project) life ratio is projected to fall below a minimum level in **any** future year. A spreadsheet model will have trouble with circular references if it attempts calculate this provision. The package should solve this problem by iterating through future balance sheets for each year when necessary.

Include the capability to adjust the cash waterfall

• **Cash Waterfall (or Waterfall of Accounts)**

The cash waterfall is the term used in the loan agreement which describes the order in which funds are disbursed from the escrow account. Typically, senior loans have priority, but the order of other cash flows such as prepayment and subordinated loan principals and interests may typically be negotiable. It would be useful for the software to give the user the option to change the order.



Generates the project balance sheet

• **Balance Sheet**

Analysing the financing of projects is all about the cash flows, however there is still a need for a balance sheet. Loan agreements may typically specify that dividends cannot be paid until the debt to equity ratio falls below a certain amount. It should also contain currency adjustment factors whenever there is more than one currency in the project. Failure to include a balance sheet and to display the currency adjustments on a multiple currency project is a sure sign that the accounting currency has not been considered and is an important warning sign.

The legal structure has an effect on the cash flows

• **Legal Structures**

Most project financings involve a Special Purpose Vehicle (SPV) which is set up as a corporation, though there are other legal structures which would affect the modelling.

Partnership. A partnership may enjoy special corporate tax status, and tax payments are made by the partners. The package should display the partnership's cash flows as well as the cash flows for each of the partners.

Joint Ventures. The term "joint venture" has many meanings and relates to the ownership and governance structure of a project where multiple partners may or may not elect to have a single ownership and management structure that is formally incorporated. Each partner may have different funding and fiscal arrangements and the software should be able to display these separately for each entity.

Multiple Corporations. The development of natural gas often requires a chain of plants and companies to commercialise the gas. The investments consist of the gas production facilities, the LNG/LPG plant, the LNG ships and the regasification terminal. Each may be owned by a different company with different shareholders, located in different countries, but all linked to one another. The package should handle such a chain of projects, allowing say, the price of the product pipeline gas to change and the user can see the ripple effect through the companies.

Leases. A lease is the process by which one party (the lessor) owns an asset and makes it available to another party (the lessee) for a consideration often a rent. The purpose of using a lease is to take advantage of potential tax benefits which a lessor can access and pass on to the lessee. The lessor may fund the project from its own funds or may seek loans from third parties (a leveraged lease). There are various types of leases such as financing and operating leases. The software should display the project from the view of the lessor as well as the lessee. It should also display the project without a lease. The benefits of leasing are often country and industry specific and can change at short notice. The user must always take proper tax advice before modelling a lease.

Reserve based financing. Natural resource industries feature a number of funding arrangements which can be described as project finance including service agreements, buy backs, leases etc in which there is not necessarily any external financing. In these types of financing arrangements, the software package should include the ability to model the cash flows as seen from the perspective of the reserve owner and separately from the point of view of the investor.

Software should include different forms of equity and loans to fund the project

- **Funding Sources**

Project funding typically comes from a combination of potentially several different classes of equity and loans. These may include preferred stock, senior and subordinated loans, export credits and bonds. Export credits are funds for the supply of equipment and material supported by the government of the country supplying them. The package should calculate the draw down in-line with the delivery and since this must occur before the construction starts, the package should show the export credits drawn down early in the project construction phase.

It may be possible to fund some of the investment from the revenues produced by early operation of the completed part of the facilities. This may apply to projects with networks such as toll roads and railways.

There may be other classes of loans used mainly during the operating phase, such as working capital facilities and feed supply credits.

Software should include sinking funds

- **Sinking Funds**

Sinking funds are typically needed for loans (debt service reserve account), reinstatement costs, abandonment on oil and gas and other natural resource projects, dry docking on shipping projects, plant closures etc. The user should be able to specify the target balance and currency of the fund.

Software should be compliant with IFRS and other relevant standards

- **Accounting Statements**

Accounting bodies are encouraging major corporations to adopt the IFRS (International Finance Reporting Standards) in their reporting. These standards allow several different forms of presentation of the main accounting sheets (income/profit and loss, cash flow statements and balance sheets). One side effect is that they will be able to present their accounts on the web in an XBRL format. (Extensible Business Reporting Language). The package should ideally be compliant with IFRS and should be capable of applying other relevant standards.

- **Interaction between design, market and financing**

The models for some technologies should take into account the fact that increasing demand for a service during the operating life of a project may involve additional investment. For instance, a toll road may be built with four lanes initially but increasing demand will require the subsequent addition of another two lanes to maintain a design level of service. The software should take into account the additional investment and a sinking fund to ensure that sufficient funds are available.

Analysis Module

Capability to include different cases or scenarios

- **Cases (Scenarios)**

During the development of the project, it is useful to consider various alternative cases (or scenarios) in addition to the base case. In the planning phases the different cases may contain different project configurations. During the contractor bidding phase they may contain the different contractors' offers. During later phases they may contain different funding bases and in subsequent phases they may contain "high" and "low" cases (or "extra high" and "extra low"). The user should be able to add and delete cases as required.

Capability to include the "what if" analyses

- **Sensitivity Analyses, Monte Carlo Simulations, Break Even Analysis**

The package should have the capability to produce the expected sensitivity analyses including spider diagrams, tornado diagrams, break even analyses and risk analyses using Monte Carlo techniques without any additional issues, (see the separate white paper on carrying out a risk analysis with a project finance model).

Capability to include a goal seeking facility

- **Goal Seeking**

The package should also include a goal seeking facility in which the user specifies the required figure for the result and the variable to be altered. For instance, the user may want to know what the product price should be in order for the project to produce a real equity IRR of 15%. The software should present him/her with a suitable dialog box with the possible input variables (e.g. product price) and results (e.g. real equity IRR) and it should carry out the iterative calculations without further user intervention.

Versions

Project Finance models are used by a variety of different organizations and during a variety of different phases of a project. The following versions are all based on the same source code:

Model for use in planning phases

- **Developer**

In the planning phases, the model should generate the capital cost estimate (based on standard figures) and should generate the draw down of funds during the construction phase split into local and foreign currency elements. It should also calculate the funding draw downs based on an initial debt to equity ratio set by the user.

More complex model for use in construction and operating phases as well

- **Investor**

Once the project has reached the stage where contractors have submitted their bids, the model should take as input the proposed draw down of funds. The same applies with the loans. In this case the package will calculate the initial debt to equity ratio, not the other way round. During the operating phase the user should also be able to input the actual financial results for past accounting periods. This will enable the model to calculate up to date loan cover ratios and the other key investment criteria.

Database, portfolio of projects, collaboration

- **Client/Server**

Major corporations and banks will typically have many projects on their books and several users of the software. This version is supplied with (a) a database of technical, project, commodity and country data (b) a portfolio of projects which will sum the cash flows on all the projects and provide a status report on each and (c) a collaboration facility which allows different users to supply input for specialist areas of the model, for example a technical department to supply the basic design data.

Software on the cloud

- **SaaS**

The client/server version of the software can be made available to registered users as a service available from the internet. This has the advantage of a lower initial cost and an up to date version of the software.

Secondary software should be available to non-licence holders so that they can open and print the model file

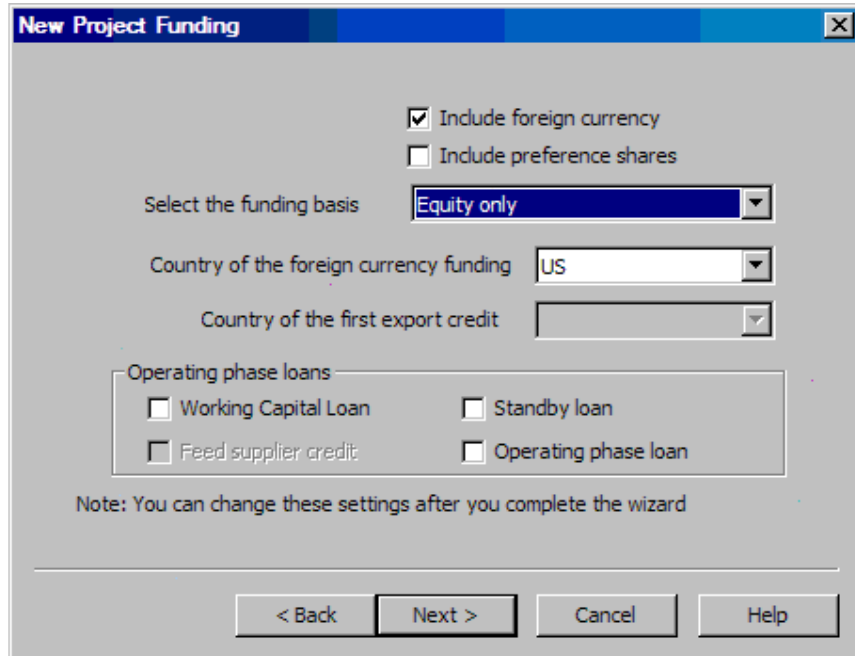
- **Reader**

The developer of the model may want to send a version of the project model to a bank or a prospective investor, but the recipient may not have a licence for the software. The recipient should be able to obtain a "Reader version" of the software which does not contain the calculation engine but allows him/her to open the files and review the input basis and the results. This version of the software should also allow the user to print out the model.

Usability

Setup Wizard

The package should have a "wizard type" set up for ease of use when the user wants to create a new model. This wizard must allow the user to configure the model for different technologies, revenue bases, legal entities, funding bases, fiscal bases and accounting bases. It should take barely a minute or two to make the right decisions and the user should be able to change most of these decisions at a later stage if he/she wants to do so, without starting afresh.



*Beneficial side effect:
Audit trail*

Input of Data

Once the user has set up the model with the wizard, he/she will need to insert the project specific data into the model. The preferred method for inputting relatively large amounts of data into a programme is through tabbed dialogue boxes which allow data entry validation. In addition, they can be used to record the name of the user who made the latest change and the date when he/she made it, together with a brief note which he/she can introduce to explain the figures. This feature addresses issues of who did what, why and when and it helps others to review and audit the model.

Beneficial side effect: Simple conversion of units

Changing the Units of Measurement

What is the difference between a higher heating value and a lower heating value and what factor do you use when you convert from one to another? And how do you convert from say 1000 tpd (tonnes per day) to Mtpa (1000 tonnes per annum)? Modellers are not always engineers and even experienced engineers make mistakes here. Thus, a conversion routine which allows the user to change the units of measurement and have the recalculated figure displayed immediately is a useful feature.

Include capability to support different languages

Languages

Project finance is used throughout the world and in different languages. Whilst English and specifically US English is a common language in this industry, users still need to understand technical terms in their own language. It would be therefore be highly helpful if the package could display information in several languages other than English.

Intelligent feedback

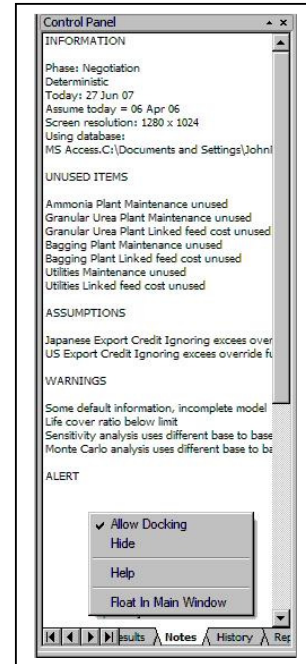
Notes

There are certain locations in the calculation sequence where the software may make decisions about which the user needs to be aware.

A well conceived package will advise the user of any assumptions and display them in a separate window. They can then be examined in further detail. It will do the same with any inputs which may lead to problems.

The diagram on the right displays feedback to the user under the following headings:

- Information
- Unused Items
- Assumptions
- Warnings
- Alerts



Transparency: Users need to see the underlying formulae

Formulae

Users want to know how the package calculated a figure in a particular cell. The package should display the formula used to arrive at the figure. In certain circumstances, the user needs to change the basis for the formula. For instance, the formula for a loan cover ratio may contain different elements in the numerator and denominator. The tabbed dialog boxes should enable the user to make this adjustment to the formula.

Pros and cons of the projection period size

Projection Periods

Should the cash flow projections be done on a yearly basis or more frequently? And if so at what time intervals? A yearly projection typically allows the cash flows on a 20 year project to be printed landscape on a single page. There is much merit in seeing all the figures for the project life printed on a single page. However, lenders like to see the loan cover ratios on a half yearly basis and some developers like to see them on a quarterly or even monthly basis. There is some benefit but the files start to become very large, so a suitable compromise is usually the best solution.

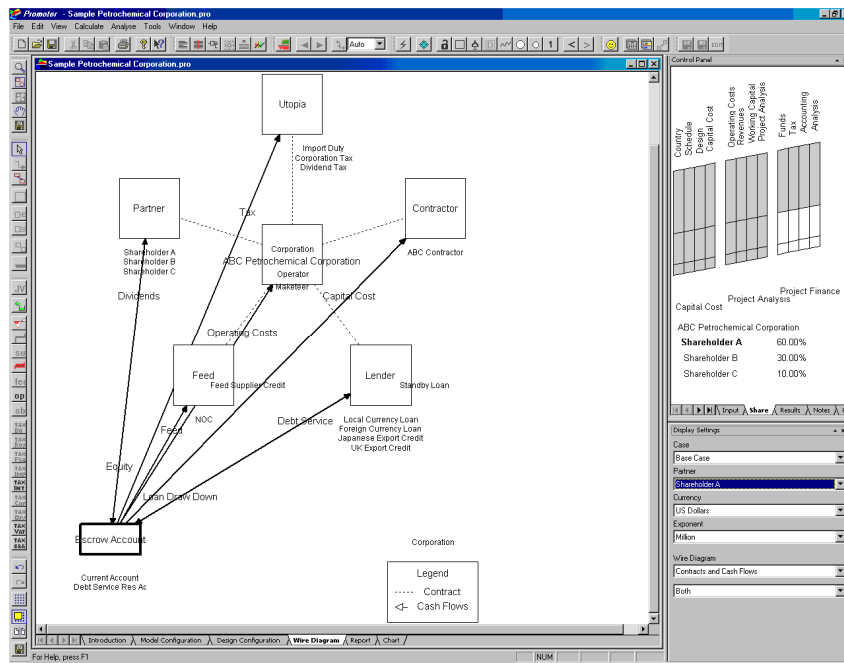
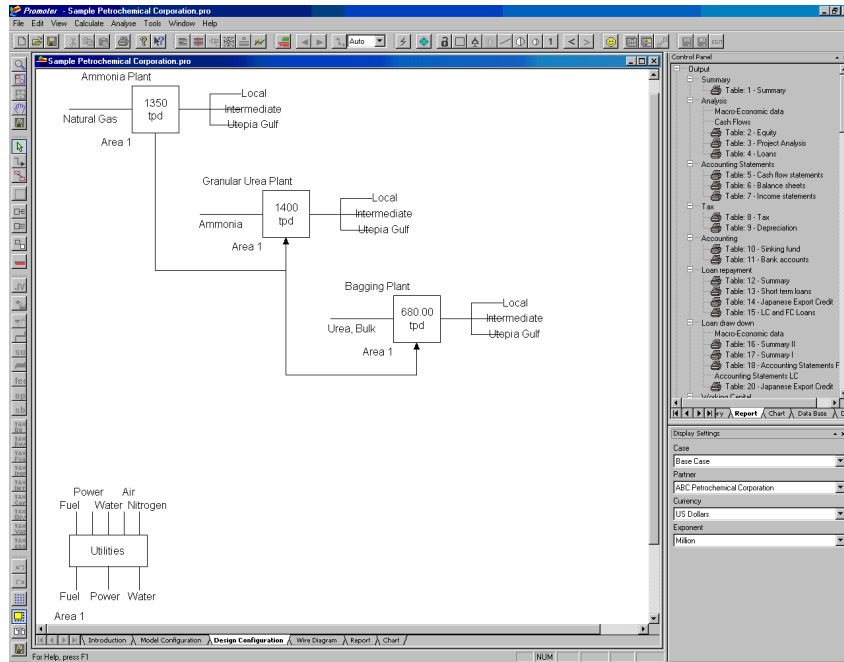
Use of charts and diagrams to describe the project

“Pictures are worth a thousand words”

Any form of illustration of the input and results makes it much easier for the user to understand the model and the project. The following all contribute to such an understanding:

- The design configuration in a simple block form
- The “wire diagram” showing the legal relationships between the key parties and the flow of funds during the construction and operating phases
- Charts illustrating both the input and output figures. The lack of such charts in a typical spreadsheet model makes it difficult for a first time user to understand what is going on.

See the figures below for some examples.



Development Platform

Choice of development language set by the nature of the software

Development Language

A project finance model must be able to run on a laptop when the user is travelling, perhaps negotiating a contract in a far off country. It must also be able to run on a server and in the cloud.

The subject of project finance is complex and lends itself to an object oriented approach. The use of an object oriented language has the additional advantage of making the software easier to maintain, extend and reuse.

The software evolved initially as an Excel add-in which explains our use of C++ as the main language.

Data storage considerations

How to store standard technical data

When you use the setup wizard, the software needs to obtain technical data for the technology which the user selects. These data could be hard-coded into the software or they could be stored in a database. There are significant disadvantages in hard-coding any significant amounts of data in the software - a database is much better suited to this task. The question then arises, what type of database, which one and how to communicate with it? A relational database is the most widely used and probably the most appropriate and there are many commercial products which fit this task. The most appropriate means of communication is probably the OLEDB technology which works with most databases. It works with say a simple Access database on the user's hard drive or with MSSQL on a corporate server.

*Beneficial side effects:
Use of a database ensures:
- consistency between models for different projects
- audit trail.*

Once a decision is made to use a database as the repository for key technical data, it becomes a simple matter of extending the software and database to incorporate all input data for the model. The model can then be saved to the database and regenerated from the same source (in addition to the more normal method of saving it and opening it from the disk) which opens up a host of opportunities.

For example:

- a) consistency across models: in an oil company, say, you could ensure that all models use a common forecast of the oil price.
- b) an audit trail is an automatic feature in MS SQL Server.

Testing is vital and must be carried out as the software is developed

Software Testing

Any software which relies on heavy computation must be tested thoroughly throughout the development and maintenance phases. Such testing will include unit (regression) testing, fuzz tests and integration tests. Typically these tests will consist of many hundreds or thousands of tests which will be carried out before issuing a new release.

Side benefit: reliability

The reliability resulting from this testing is a further side benefit which is rarely found in a spreadsheet model.

Black Box?

*Yes, certainly...
and with good
reason*

Black Box

Is the software described above a “Black Box”? Yes, in as much as an accounting package is a black box. No self respecting chief financial officer of a multi-million dollar corporation would expect a junior employee to prepare and present the accounts on a spreadsheet.

However, the software has a transparency which allows the user to understand what is going on. There are few instances when the user needs to change a formula. The calculation of the cover ratios is a case in point. This ratio is typically defined by the lenders in the loan agreement. It is a relatively simple matter for the user to decide (through a suitable dialog box) which items go into the numerator and denominator.

*Project finance
modelling does
not need to use a
spreadsheet.*

Conclusion

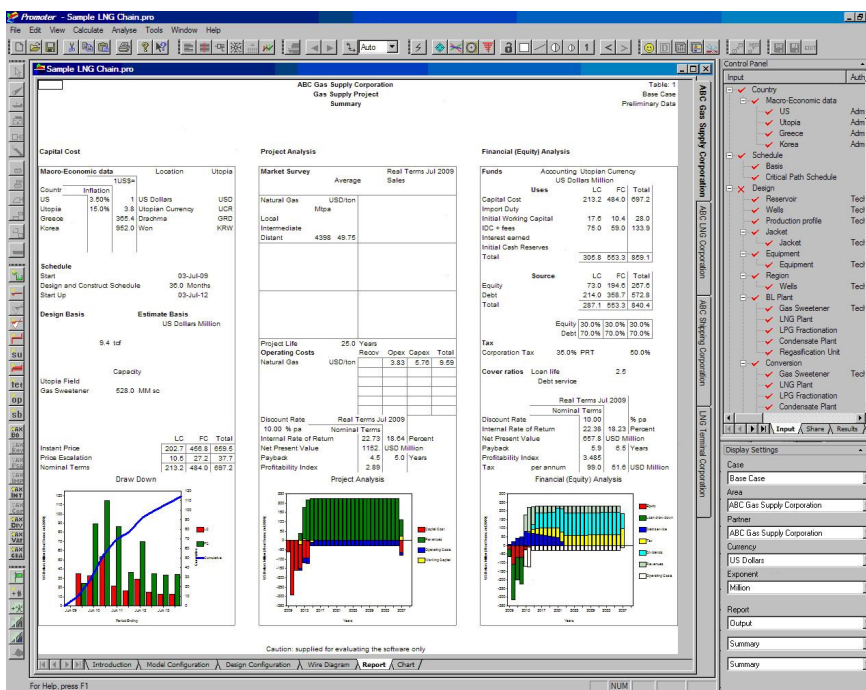
This paper examines a brief history of project finance models, the evolution of spreadsheet models, their strengths and weaknesses, the alternatives and finally the features which a “purpose made” software package must include.

*There is an
alternative tool
already available
in Promoter*

Such a package is now in existence and available in a number of different formats. It is supplied in a matrix of planning and project models, specific industry models, single user stand alone models and corporate models with a database connection. They are all based on the same underlying technology.

This white paper is the first in a series of white papers which will look at other aspects of the same subject.

*Screen view of
summary report*





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About the Author

John Macgillivray is the creator of a range of project finance software tools based on Promoter. This software incorporates most of the features described in this paper.

Project Planning and Management Ltd is a group of consultants based in London with the primary objective of producing and marketing project finance models for a number of different industries and countries.

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