Investing in Energy




A Practical Guide to Preparing and Presenting Energy Investment Proposals

sei SUSTAINABLE ENERGY IRELAND

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In association with:

Large **Industry Energy Network**

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SUSTAINABLE ENERGY IRELAND

Introduction

Why This Resource Pack?

Many managers whose responsibility includes energy management feel at a disadvantage, when it comes to trying to win support for investment in energy efficiency. There are many reasons for this, and we deal with some of these in the next chapter. However, whatever the reasons, the reality is that significant reductions in energy usage - and cost - often require significant investment. Such investments must be justified. Further than that, proposals for energy efficiency investments usually need support, if they are to be successful.

The reality is that many technical managers feel:

- That they are ill-equipped to produce really convincing investment proposals for energy-related projects;
- That such proposals often start at a disadvantage, compared with other proposals which may attract greater attention and support from the senior management team;
- That energy saving is just less 'visible' than other activities which lower costs and/or increase revenue and profits.

There is probably a considerable element of truth about such feelings. And the situation may not be helped by internal company procedures for the submission of proposals for capital investment. These procedures often make it possible to:

- Take a relatively 'hands-off' approach to submitting and promoting investment proposals - which may place energy proposals at a considerable disadvantage;
- Minimise the amount of information gathering and analysis of costs, etc. - which may seem like a happy state of affairs at first sight, but which may mean that some of the proposal's attractions will remain hidden, and/or that analyses will be performed by someone else in the organisation with much less knowledge of, or commitment to, the proposal.

In fact, it rarely pays to leave it up to someone else to assemble the arguments, or to 'manage' the proposal through the various stages of management decision making. This is particularly the case when it comes to relatively *technical* investment proposals: there may be few other people in the organisation who are competent to judge the proposal's merits and de-merits, and even fewer who really care very much about technological approaches to reducing costs (indeed, past experience may well mean that some senior managers are sceptical of the kinds of claims that are made for technical approaches to cost reduction.

There is also a problem of language. Financial managers, and those in sales, marketing and general management, often do not feel at all comfortable about technically-based arguments - it is simply not their area of expertise, and they may actively dislike the whole technical field because they are unfamiliar with it. On the other hand - and perhaps even more pertinent here - technical managers often feel even more uncomfortable with financial or market-related language and techniques. For that reason, they are often very much happier to leave it to someone else to develop the arguments for them. Where that is the case, it is little wonder that many energy-saving proposals fail.

This information package, then, is intended to provide technical staff with the ability to:

- Assess possible investment proposals - particularly in the field of energy efficiency;
- Produce more professional and more comprehensive proposals for such investments;
- Present proposals in a way that will increase their chances of success;
- Track projects so that future proposals will have even greater chances of acceptance.

It is *not* intended to be a complete text on investment appraisal analysis, however. There are many detailed textbooks on this topic, and these are readily available. The materials in this package do not address all of the approaches to financial analysis, for example, and nor are they intended to provide in-depth coverage of the topics covered. They are intended to provide an adequate overview of the area, specifically for those who are more familiar with technical issues than with financial or strategic analysis.

How the Materials may be used

This information package may be used in a number of ways:

1. It may be used as a stand-alone package of information materials, to be used by managers as and when required. For this reason, it has been prepared in order to cover most of the questions that may arise in preparing and presenting an investment proposal, and in a way that should allow it to be easily followed without further assistance.
2. It can also serve as the basis for a training course, covering most of the topics in this package. Such a course may be:
   a) Provided in-house, to a group of managers and staff with technical backgrounds who want to examine the way in which they currently prepare and present energy-related investment proposals; or:
   b) Organised as a course for managers and staff from a mix of organisations and backgrounds, who would like to learn more about this topic.

Context for the Package

This information package - and the training programmes based upon it - has been developed as a part of Sustainable Energy Ireland's Large Industry Energy Network. The need for such a package was initially identified by the members of the Large Industry Energy Network, and the research for the design and content of the package included a survey and a set of interviews conducted with managers whose companies are members of the Network. Many of the worked examples in the package are derived from materials provided by these managers.

We hope that members of the Large Industry Energy Network and others will find this package to be of practical assistance in developing proposals aimed at reducing energy usage and costs in their organisations.

What is Included in the Package?

Three related sets of materials have been developed[1]:

1. A set of notes covering everything from common causes of failure, to financial analysis and appraisal, to presentation of the proposal. These notes include worked examples and tables, which provide most of the figures needed for the financial analyses covered.
2. A set of teaching notes, to assist in using the content of the pack as a training course. In actual fact, a variety of training events may be designed on the basis of the material in the Guide. These may include:
   - A short introductory workshop on the main issues involved for technical people in preparing and presenting proposals;
   - A stand-alone session on the financial assessment approaches in the Guide, aimed at non-financial technical staff;
   - Stand-alone sessions on presentation of the proposal (written and face to face);
   - A modular course for running with staff from one or two companies, with group work on the development of proposals based on what is covered in the Guide.

Most or all of the above would normally be run using procedures and criteria specific to the company(ies) involved.

Training could be delivered by arrangement with Sustainable Energy Ireland, or using in-house trainers.

3. Overhead slides and other materials for use in delivering some of the 'standard' sessions described above.

1 The first two of these are contained in this folder. Overhead slide files are provided in Powerpoint format in the accompanying disk, and some extra materials may be available from SEI.

Part 1

The Guide

A Practical Guide to Preparing and Presenting Energy Investment Proposals

In researching the need for support in the area of energy investment proposals, it became clear that technical staff badly need practical guidance on many aspects of producing and presenting successful proposals. This guidance was not simply needed in learning how to do various financial assessments - though this was an identified need. It was also needed in relation to writing a coherent proposal, and in learning to influence the system so that your ideas will be heard. Research revealed that this kind of guidance wasn't readily available. There are plenty of books on financial appraisal, and plenty on power and influence, and even more on producing reports, but nothing that draws all these things together for the technical person.

Two possible means of providing support were identified:

1. A simple, practical, easy-to-read written guide for technical staff and managers with little current knowledge of investment proposal appraisal and presentation.
2. Training modules or courses on some or all topics covered in the package.

The first of these is provided in Part One of this package. It aims to address almost all of what might be needed by the average technical person who is going to prepare proposals for investments. It doesn't cover everything, and many things are only touched upon - simplistically in some cases. However, it should provide more or less all you need. It also frequently tells you to go and look for additional information specific to your own organisation. Every organisation has its own rules and its own procedures - including quite different accounting practices to suit their particular needs and contexts.

We hope that the Guide is easy to read and to understand. It may seem too simple in places - but remember there is always someone who knows less than you! We hope that it will provide some answers, and that it will spur you to ask more questions within your own organisation.

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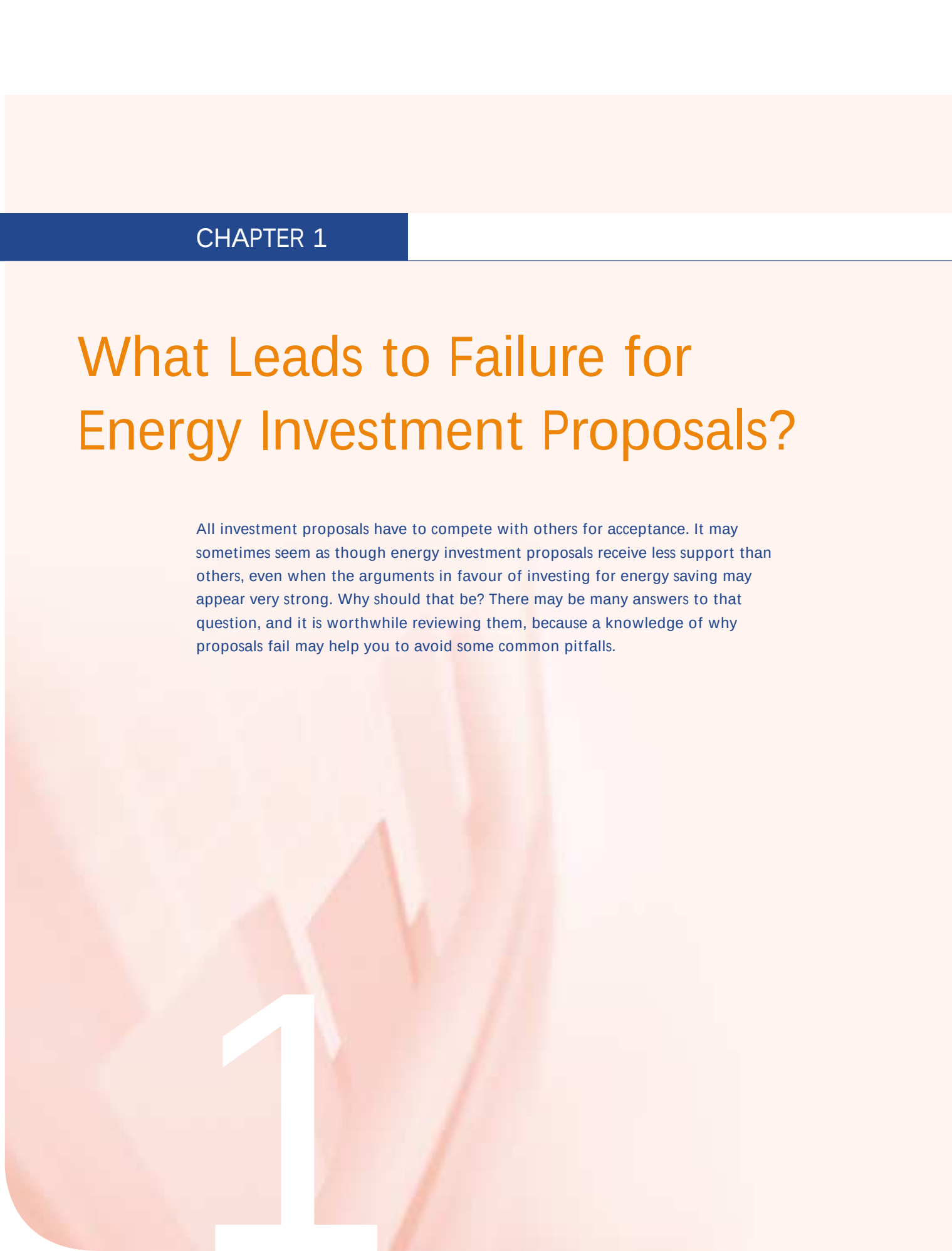
CHAPTER 1

What Leads to Failure for Energy Investment Proposals?

All investment proposals have to compete with others for acceptance. It may sometimes seem as though energy investment proposals receive less support than others, even when the arguments in favour of investing for energy saving may appear very strong. Why should that be? There may be many answers to that question, and it is worthwhile reviewing them, because a knowledge of why proposals fail may help you to avoid some common pitfalls.



Some Common Causes of Failure

Energy managers and other technical staff often hold the gloomiest view of the chances for success of an energy investment proposal. This in itself isn't the best starting point in preparing a proposal that is designed to win: it tends to start off a self-fulfiling prophecy in which the manager feels that there is little point in investing time and effort in making the proposal in the first place! Such an attitude may prevent the proposal from being made at all, or it may lead to a decision not to invest too much work in the proposal, since it isn't going to succeed. Here are some of the more common reasons why energy investment proposals *don't* succeed.

Poor or incomplete analysis

It seems from a survey of major companies that many technical managers look only at simple payback, and then leave it up to the finance department to carry out any further detailed analysis. While many companies may consider simple payback to be the principal criterion, for larger or longer term projects it really is not adequate. It may also be that some energy investment proposals will look even better based on deeper financial analysis. Some may look worse - but the point is that the person making the proposal should be involved in any financial analyses of the proposal. That requires at least some level of knowledge of the different analyses and how they are performed - which is one reason for producing this support package.

Costings which don't reflect reality

It can be very difficult to assess accurately the costs and returns from an energy-saving investment. Often the predicted savings are taken from the supplier, and it is rare indeed for such estimates of savings to be under-stated! They are usually quoted on the basis of ideal conditions, and these may not reflect much of the reality in your own plant. Equally, it is rare for suppliers to overstate the costs of purchase, installation, running or maintenance. After all, they are trying to do what you are doing internally - namely, to persuade you to buy and install their equipment.

Of course, the supplier has to be a primary source of information, but it is important not to accept the estimates of costs and savings without considerable questioning. Preferably, you should also obtain independent assessments of the costs, benefits, advantages and pitfalls of an investment. More independent data can come from articles written up in the literature; from data provided from independent sources of information, such as Sustainable Energy Ireland, or from external consultants who have no particular axe to grind in terms of a given technology or make of equipment; or from the experiences of other companies which have travelled the same road in search of energy savings. It is worthwhile pursuing all of these sources of information in search of reliable data on costs and savings. Indeed, this is a task that can be treated as an ongoing part of the energy manager's job, so that you build up a data-bank of information on different

technologies and products over time, allowing you to draw on it as required. When presenting the proposal, you can often summarise your sources of information, thus building up other managers' confidence in the figures you are quoting.

It is also worthwhile to assess the likely margins of error in the figures you use, and this will be addressed later on.

Incomplete data

It is very easy to forget to include vital data, such as the impact of the proposed investment on maintenance and/or downtime, or the extent to which it will fit in with future changes in product mix or specification. This may mean that the proposal is undersold, or that those making the decision will have unresolved concerns about it.

Inadequate financial return

This is related to the point above. The proposal may look excellent from the point of view of simple payback, but much less attractive when the timing of savings is taken into account. If you haven't looked at this aspect, your proposal will not be able to suggest alternative and more positive ways of viewing the benefits.

The proposal is too long or too short: Sometimes you have to present proposals according to a standard format, which is frequently very short. However, normally it is acceptable to add annexes with further information. What often happens is that the main proposal form is very brief, and an enormous amount of additional data - rather poorly presented - is attached as annexes. Annexes are frequently not read in great detail, particularly if they are very long and/or poorly presented. It is usually better to ensure that annexes are no longer than they have to be; that they contain useful supportive data; that they are well signalled in the main proposal; and that they are laid out so that the points in them supporting your proposal are clear and easy to access.

Too much competition for funding

Many energy managers point out that capital is scarce, and that energy investment proposals have to compete for funds with many other proposals. This is undoubtedly true in many cases. However, it is no reason for not making proposals, and for not putting up a good case! In fact, it underlines the need to make the best case possible. This can make it more important for you to make the best financial case possible, and to ensure that you make very clearly the financial and non-financial arguments in favour of what you propose.

The proposal doesn't make an adequate link with corporate strategic plans

If you don't know, very clearly, what the current corporate strategic priorities and plans are, then your proposal may not stand much chance of acceptance. Indeed, knowledge of the strategic priorities may suggest to you that you should not even try to make the proposal at this time - and it may often be better to delay a proposal rather than to make it when there is a very high chance of failure. However, it may also be that you can present your proposal in such a way that you make very clear how it will impact positively on strategic objectives. For example, if a strategic objective is to improve site profitability over time, your proposal should explicitly show how the investment will achieve this; if there are strategic objectives to improve corporate performance in respect of environmental impact, then you could show very clearly how this proposal will make a real difference to emissions.

Energy may not be seen by the company as "strategic"

In some organisations energy investments seem to be viewed as being less strategically important than others that more directly impact on (for example) customer service. This may be a fact of life in some cases. However, energy savings impact directly on the bottom line; assuming your financial analysis is adequate, this may translate into improvement in profitability (of course, it may not, but you should know, one way or the other), and this is almost always seen as "strategic"! Also, the whole area of energy and energy-related emissions are becoming more and more important from a strategic viewpoint. After all, all organisations nowadays have to be concerned about their image as environmentally aware; licensing requirements, including attention to energy use, can represent very real strategic barriers; and most companies are more and more aware of the strategic barriers they may face in the not-too-distant future from issues such as energy taxation, emissions trading, and the like. Energy use and energy-related emissions are becoming more and more "strategic" and, if the company is not yet aware of this, then you have a broader selling task on your hands.

Benefits not presented in such a way as to address other people's priorities

It is important to remember that the proposal is an attempt to "sell" your ideas. To do so, you have to address the needs, concerns and priorities of those who will make the decision. It may be that there are priorities elsewhere in the company which *could* preclude your proposed changes; it may be that your proposal could provide benefits that are in line with other people's needs. For example, you may be able to show how the proposal will improve product quality in some way, or increase reliability or flexibility in some way. It is vital to know the priorities of those who will make the decision about your proposal, and to make sure that these priorities are addressed - in terms that others will understand and relate to.

Insufficient attention to influencing others

It is hardly ever sufficient simply to produce a proposal for an investment, and to let it sink or swim: all too often, the result is that it sinks! Winning proposals involves influencing others, and that means building a coalition of support for the proposal among those who will be involved in the decision process. It may also mean taking the time to explain on a one-to-one basis to key decision-makers what you are proposing and why it should be supported. It certainly means taking the time to find out what their needs and concerns are.

Failure of previous investments to live up to their promises

This can be a major problem for energy managers. If, in the past, proposals were made for investments that did not meet expectations, then the chances for future proposals are reduced. For this reason, you have to make absolutely sure that each proposal is based on sound information, and that it doesn't over-promise. You need to see each proposal as being one in a *succession* of proposals, each one contributing to a belief that energy investments can and do lead to positive results. It may also be that previous investments *have* provided the returns that were promised, but that these have not been adequately measured or reported upon. Again, this can be a particular problem with energy, because it may be so invisible. Later on, we will be advocating an approach which ensures that the performance of energy projects is tracked and reported upon: this should contribute to building up a track record. It may, of course, also provide you with some salutary lessons about the problems in making investment proposals really work in terms of results for the company!

Factors Working in Favour of Energy Investment Proposals

On the other hand, it is very easy to take too gloomy a view of proposals for energy-related investments. The reality is that the climate is continually improving for investments that will reduce energy consumption, or reduce energy-related emissions, or increase security for the company. Although these are generally well known, it is worthwhile listing some of these positive factors that can work in favour of your proposals.

Energy reduction usually goes straight into profits

Energy cost may not be large compared with other cost categories such as staff or raw materials. However, it is often a significant cost when compared with *profit*. Even a relatively modest saving on energy cost may represent quite a significant percentage improvement in profit. Of course, you also have to take into account the potential *return on the investment*, as opposed to merely the absolute reduction in cost or increase in profit. But energy cost reduction can be at least as significant from the point of view both of profit increase and improved return on investment as any other project. It can also be much less risky than other investments such as new product development.

Energy projects can lead to easily quantifiable and immediate savings

There are few enough investments that will lead to more or less up-front savings. Indeed, many energy investments also may have a lead-time before the new equipment is installed and the savings start to flow. However, many energy investments can lead to cost savings very quickly - more quickly than investments aimed at increasing sales, for example. Furthermore, if you take the time and trouble to track the savings and to report on them, they are usually quite readily quantifiable, and the cause-effect links are usually quite obvious - much more so than (for example) investment in advertising, which may or may not lead to improved sales, and whose effects may be masked by many other factors. However, it does require that you be prepared to track investments, and to analyse and report on their results.

Energy investments can often be based on marginal costs

It is frequently the case that energy-saving investments can be proposed at a time when equipment is being replaced anyway, for other reasons. This means that you only need examine the *marginal* investment required to install the energy saving equipment, and not at the full cost. This can mean: (a) that the capital you seek is relatively low, and (b) that the return on the energy investment can be expressed as a return on the *marginal* cost of the equipment: the difference between the 'standard' equipment and the somewhat more expensive energy efficient equipment.

Energy investments can often confer other benefits:

Many energy investments can lead to other benefits, which should be pointed out. For example, a bank of air compressors may mean that even if one compressor goes 'down' for a period, there will be stand-by equipment available to take its place. Increased security, flexibility and/or reliability are positive factors that should be identified and stressed in your proposals.

Energy reduction is linked to other priorities such as environmental issues

Environmental concerns are of increasing importance for most organisations, and organisations often want to be seen to be proactive in taking action to reduce energy consumption and to reduce emissions related to energy use. On top of this, there is the link to EMAS, IPC/IPPC licensing, etc., and energy-saving investments are one way in which action can be seen to be taken *while at the same* time producing financial returns for the organisation. It is worth pointing out that almost all other approaches to environmental improvement have associated costs to the organisation, without any commensurate financial return.

Controlling energy use is increasingly important from a strategic point of view:

At time of publication, stringent measures are about to be introduced in Ireland, to contain the growth in greenhouse gas emissions. For the industrial and commercial sectors, this means:

- *A regime of energy taxation, already announced by the Minister for Finance. It is likely that further details will be announced in 2004;*
- *A series of negotiated agreements between government and industry sectors, which will generally involve companies moving towards international best practice and technology. These agreements will be binding, and they will be monitored. The first agreement may be in place within 2004/5. Performance of companies within negotiated agreements will probably have implications in terms of potential reductions in tax burden.*
- *Introduction of EU and international emissions trading. Sites in trading (i.e. with a thermal capacity of 20MW or greater) will be issued with a certain number of emissions credits, and will have to purchase any additional permits on an emissions market. The price of permits will be determined by the market; assuming that (a) there is a shortfall in credits issued, and (b) there is a continuation in economic growth, the price of buying emissions permits could rise sharply. Apart from the cost of emissions, any shortfall would either impose financial sanctions on a company, or it might impose limits of future growth. The inclusion of electricity generators in the EU emissions trading system is likely to mean increased prices for electricity.*

Thus, energy use is indeed an increasingly *strategic* issue for companies, and energy investments will increasingly be seen as strategic. Even apart from the strategic nature of energy investment, the higher cost of energy use arising from taxation/agreements and from emissions trading will make energy investment proposals look increasingly attractive.

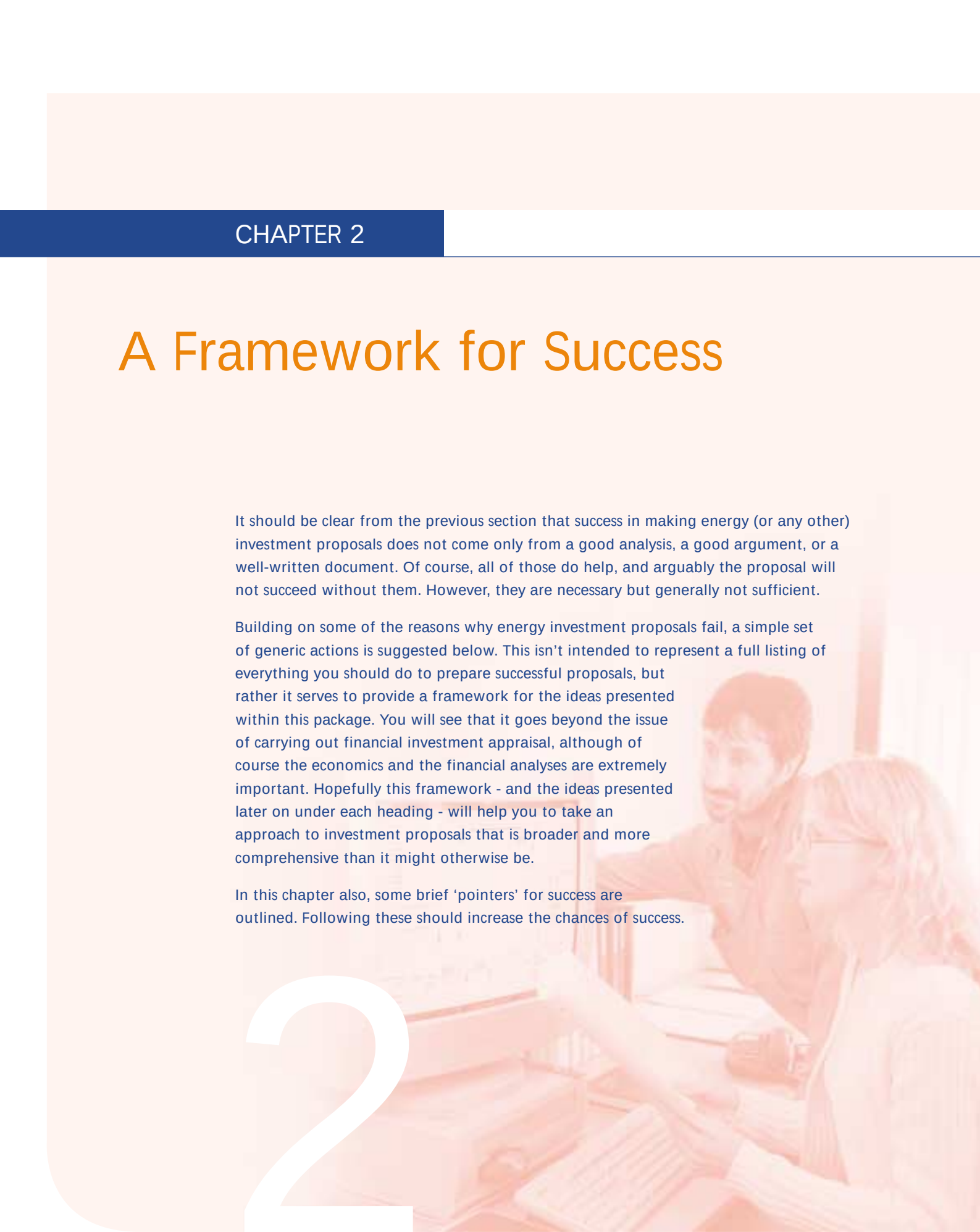
CHAPTER 2

A Framework for Success

It should be clear from the previous section that success in making energy (or any other) investment proposals does not come only from a good analysis, a good argument, or a well-written document. Of course, all of those do help, and arguably the proposal will not succeed without them. However, they are necessary but generally not sufficient.

Building on some of the reasons why energy investment proposals fail, a simple set of generic actions is suggested below. This isn't intended to represent a full listing of everything you should do to prepare successful proposals, but rather it serves to provide a framework for the ideas presented within this package. You will see that it goes beyond the issue of carrying out financial investment appraisal, although of course the economics and the financial analyses are extremely important. Hopefully this framework - and the ideas presented later on under each heading - will help you to take an approach to investment proposals that is broader and more comprehensive than it might otherwise be.

In this chapter also, some brief 'pointers' for success are outlined. Following these should increase the chances of success.



Making Successful Proposals: A Framework for Action

The steps below are *not* intended to be undertaken in the sequence in which they are presented, although some do follow one another more or less sequentially. Indeed, some of the steps should be taken in parallel, and some involve activities that are ongoing throughout the proposal preparation and submission stages and beyond.

The steps are as follows (they are described only briefly here, and in much greater detail in later sections of this package):

- *Gather all necessary information*
- *Assess the proposal(s) realistically*
- *Develop an influence strategy*
- *Present the proposal so as to win support*
- *Follow through*

1. Gather all necessary information

In the first place, it is necessary to gather information on the various options that face you, in terms of what investment proposals you should make. It is quite rare to have only one possible investment - chances are that you have many ideas, all of which may present you with possibilities for reducing energy use and saving money. You need to make sure that the proposals you are putting forward are the *best* ones out of all of the alternatives.

Your choice of which proposal(s) to put forward will depend on a number of issues. One may be a matter of strategy: if you have an overall strategic goal for energy use in your organisation, this will provide a basis for selecting the broad areas in which you may make proposals. Another may be a matter of timing: that is, what time is available/required for various lines of action. And of course another is the question of which projects will lead to the best returns and benefits. Finally, there is the issue of which projects are likely to lead to support. And if you are able to select lines of action which will be *additive* - investments that make sense from the point of view of forming building blocks to something bigger - then that will provide you with a broader framework within which to build this and subsequent proposals.

You also need to make sure that you have all relevant information available on current corporate plans that may impinge on decisions about the kinds of proposals you may make. This includes current policies, strategic objectives and priorities, and corporate plans regarding plant capacity, upgrading, environmental action, and so on. And it is important that you have all available information on the *environment* within which the plant will be operating in Ireland, over the time period to be considered. Issues such as future energy taxation, emissions trading and the like will have a considerable bearing on the environment for energy-related investments - or *should* have! And these issues are more likely to *favour* your proposals than to work against them.

Finally, you need to make sure you have as much data on investment costs and timings as possible, as well as on likely savings (and the timing of those savings) arising from the various proposals you may make. This will be covered in much more detail later on.

Some pointers:

- *Gather as much information as possible about costs and benefits.*
- *Wherever possible, gather information on how similar investments have worked in other situations - perhaps in other plants within your company, or in other companies.*
- *Make sure you have all the necessary contextual information - both in relation to the company and to the energy/environment context in which the plant operates now and will operate in the future.*

2. Assess the proposal realistically

We have already suggested that it isn't sufficient to leave it to the accountants to carry out the financial assessments of your proposals. Unfortunately, this is often what does happen: the technical manager looks at the likely payback, and leaves it at that.

Leaving it to someone else is to take the risk that the analysis will be carried out by someone who doesn't know all of the issues as well as you might. It also risks that the appraisal may be carried out by someone who doesn't have the same level of faith in the benefits of energy saving projects! And the presentation of the results of any appraisals may not be such as to be as persuasive as it might be.

Of course, financial appraisal is important, but it isn't necessarily the only consideration, by any means. If you carry out the assessment yourself, you can decide whether or not to proceed at all (and sometimes a tactical withdrawal is by far the best option), and you can work on setting out the benefits - and addressing possible objections - in such a way that it will work best for your proposal.

Some pointers:

- *Work on the basis that you will never present a bad proposal; to do so is to risk your own personal credibility, to waste your and others' time, and to place future proposals in jeopardy. If the assessment is bad, then consider not proceeding at this time.*
- *Bear in mind though, that circumstances change. What looks like a bad proposal now may make a great proposal at some time in the future.*
- *Try to gather useful data and information on an ongoing basis, and file it so that you can find it and use it in assembling and appraising proposals.*
- *Be your own harshest critic. If **you** aren't prepared to criticise your own ideas, there are lots of other people who will!*
- *Make sure you have up to date information on the evaluation criteria used currently within your company.*

3. Develop an influence strategy

This is actually something you should attend to right at the start. It is mentioned as number three here simply because, if you assess an idea and decide that it is a *bad* idea, then you don't currently have a focus for your influence attempts. However, in reality the core function of all managers is to try to influence others so as to meet desirable objectives. This is an ongoing task, and effective managers will pay attention to it all the time.

It is particularly important when it comes to energy and/or to technology, because most other managers couldn't care less about either - or think they couldn't care less. In reality, they often don't understand either energy or technology, and the reaction is to avoid the topics like the plague. Also, they tend to believe that corporate success comes from good products that meet customer needs, and from the right strategies employed in the right markets. Of course they are right; but the very best of products made at too high a cost will not sell. And companies that position themselves so that they are vulnerable in relation to environmental issues or to future energy use constraints and cost hikes may have little opportunity to bring their excellent products to the market! It is vital that you have an ongoing influence strategy that will ensure that energy matters are seen as relevant.

In relation to a specific investment proposal - particularly a large proposal involving big decisions - you also need to think about influencing key people in the management team; it isn't sufficient to simply write a proposal and launch it into an unprepared organisation. This is something to be thought about right at the start, and to be tackled as an integral part of preparing, assessing, submitting and processing the proposal. We will deal with this in much greater detail in a later section.

Some pointers:

- *See influencing as an ongoing task - of particular importance in relation to energy, the environment and technology.*
- *For important proposals, make sure you know exactly who will influence the decision process, and develop your own plans for maximising the possibility of support for your proposal.*
- *Don't leave it up to the written proposal. Influencing is almost always a face-to-face process carried on over a period of time.*
- *Make sure you know others' concerns and priorities, and try to make sure that your proposal will address these, as well as your own.*

4. Present the proposal so as to win support

There are at least two aspects to presentation of the proposal. One is the written proposal, which in many cases is presented using an established company format - although, in others, there is freedom to present it in any way you wish. Whether you are required to use a 'set' format or whether you can design your own format, the written proposal should be given the time it deserves, and it must be set out in such a way that it does real justice to the proposal, at the same time without overselling it in an unrealistic way that people will see through. It should contain all the information needed to allow people to assess quickly the merits of what is proposed. Unless the proposal can be written so as to convince - unless you yourself are convinced - then it probably isn't ready to be presented. Perhaps a better alternative would be to prepare a short document with the various alternatives, and to use this to seek opinions and test support; indeed, this can be an effective way of gaining support for the proposal when it is finally submitted.

The other aspect to presenting the proposal is communicating it to those who will make or influence the decision. This is usually verbal, and it may involve informal one-to-one communication and/or more formal group presentations using visual and other aids. Either way, it requires preparation. Good and effective presentations are very rarely made simply by people who have charisma and a persuasive charm; they are usually the result of preparation and thought.

Some pointers:

- *Be prepared to put a lot of time into both written and verbal presentations of your ideas. After all, you may have invested a lot of time in working out the details, and you may have a lot of personal investment in the outcome. And you should see this as an opportunity to sell yourself and your ideas, and to promote the whole area of energy efficiency (or whatever your objective may be).*
- *Make sure that the proposal is laid out carefully and clearly, so that the key benefits and issues can be seen and understood quickly.*
- *Avoid unnecessary technical detail or jargon, unless you are addressing a technical audience.*
- *Make sure that your presentation addresses others' needs and concerns.*
- *Don't make it too long, but don't undersell it either. If it needs to be lengthy, then write a really good summary, which is probably all that most people will read, anyway.*
- *See the presentation as an opportunity to sell the idea, not to make you look clever.*

5. Follow through

It may sound strange, but many proposals that are accepted fail subsequently because the proposer does nothing to implement the decision. This can happen for many reasons, not least because you may find that you just don't have the time or resources to enable you to progress the investment - to obtain the necessary outstanding information, to prepare the detailed specifications, or to actually go ahead and acquire, install and supervise the commissioning of the investment. Indeed, although there are no figures available on this, it is very likely that only a small percentage of those proposals which are accepted actually get fully implemented. Of course, this damages credibility; it represents a lost opportunity; and it means that you have wasted valuable time in making the proposal in the first place.

The other issue is that your success or otherwise in implementing decisions in favour of an investment will play a major part in determining your success with future proposals. In fact, if you haven't implemented a decision in favour of a proposal, it is much less likely that you will go to senior management with another one - this would expose you to the risk of being asked what happened to the last one!

Assuming that you do go ahead and implement the proposal fully, you should not stop there. You need to monitor the results, in order to learn more for yourself about just how many of the expected savings were achieved. Sometimes the results will be much better than had been anticipated although, sadly, often projects don't yield the results that had been expected. However, if you systematically monitor the results, you can learn valuable lessons for yourself and others in the plant, and you can use these results to help you to influence future proposals in your favour. You can also generate a running 'bank' of savings that could be used as a means of justifying future investments.

Some pointers:

- *Make sure you have as much preparation done as possible, so that you will be in a position to proceed quickly, after the "go" decision has been made. This will reduce the chances of a downturn in the company's fortunes leading to a revision of the decision.*
- *As part of your influence strategy, make sure you have included all those who will be needed in order to proceed with the project. This includes production and maintenance staff, for example, and maybe many others who are not directly involved in the actual decision on the proposal - but who are vital to implementation.*
- *Establish systems to enable you to track the results of projects over time - and use the information both to learn more about what works and doesn't work, and to inform and influence future proposals.*
- *Publicise the gains made from successful projects.*

Concluding note

The above framework will be used as the principal basis for the subsequent materials in this package. In most cases, a step is covered in one chapter or section; in others, however, there is a need for a certain amount of preparatory information: for example, the financial analysis requires some initial concepts to be covered, before proceeding with the analysis itself.

CHAPTER 3

Gathering the Necessary Information

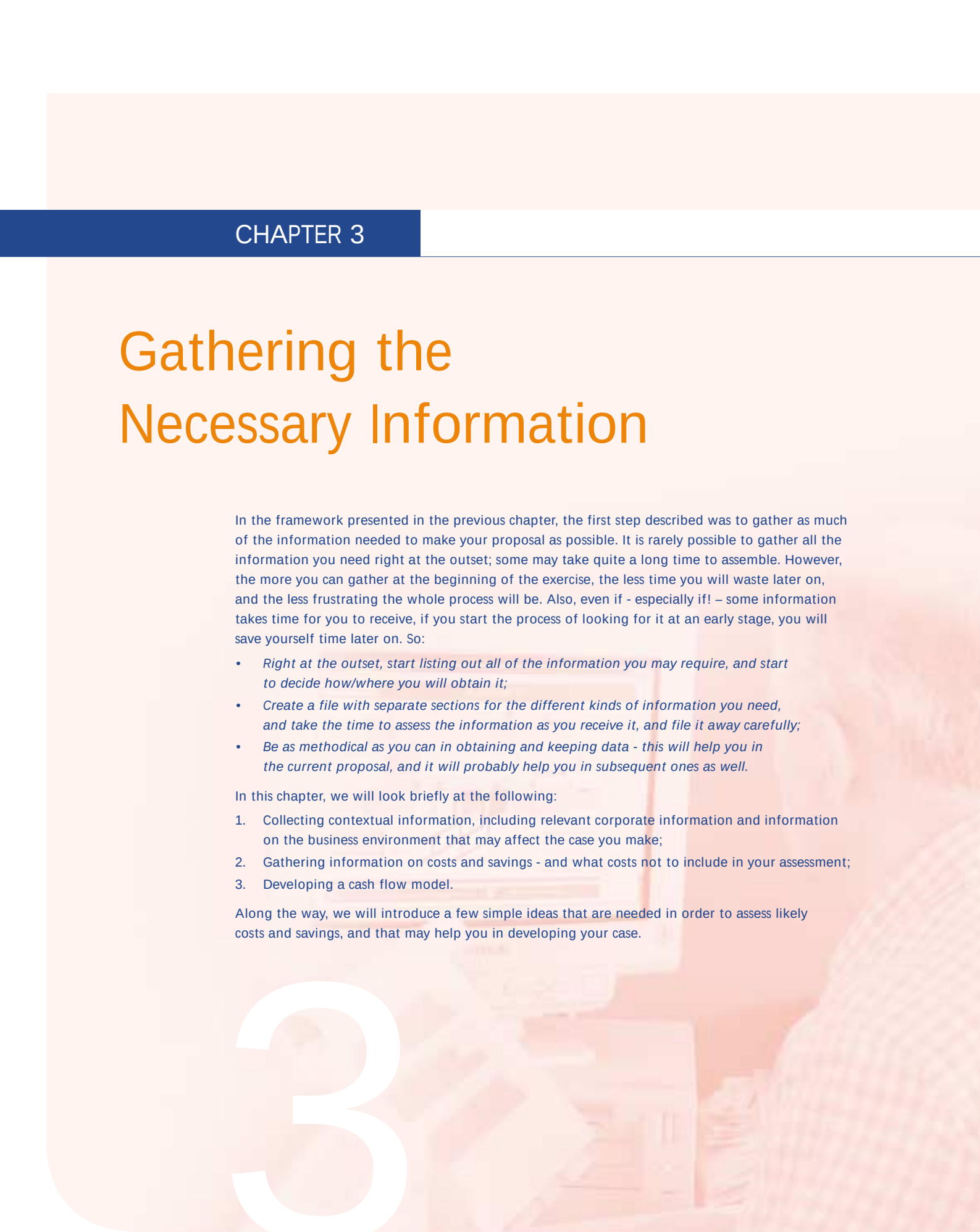
In the framework presented in the previous chapter, the first step described was to gather as much of the information needed to make your proposal as possible. It is rarely possible to gather all the information you need right at the outset; some may take quite a long time to assemble. However, the more you can gather at the beginning of the exercise, the less time you will waste later on, and the less frustrating the whole process will be. Also, even if - especially if! – some information takes time for you to receive, if you start the process of looking for it at an early stage, you will save yourself time later on. So:

- *Right at the outset, start listing out all of the information you may require, and start to decide how/where you will obtain it;*
- *Create a file with separate sections for the different kinds of information you need, and take the time to assess the information as you receive it, and file it away carefully;*
- *Be as methodical as you can in obtaining and keeping data - this will help you in the current proposal, and it will probably help you in subsequent ones as well.*

In this chapter, we will look briefly at the following:

1. Collecting contextual information, including relevant corporate information and information on the business environment that may affect the case you make;
2. Gathering information on costs and savings - and what costs not to include in your assessment;
3. Developing a cash flow model.

Along the way, we will introduce a few simple ideas that are needed in order to assess likely costs and savings, and that may help you in developing your case.



Contextual Information

By "contextual information", we mean the kind of data you need to have about:

- *the issues facing the company that may affect their decisions on capital investment; and:*
- *the kinds of information you should have at your fingertips regarding the business environment, that may have a significant impact on the strength of the case you make - including the costs and savings you project.*

Company/strategic issues

It is vital to know as accurately as possible about the company's **current strategic objectives, policies and priorities,** both regarding your own local plant and regarding the company as a whole, if your plant is part of a larger group. It may be, for instance, that the company's objectives include the aim to become a world leader in respect of use of *technology* and stance towards the *environment*, which could favour any proposals you may make. On the other hand, the company may be embarking on a trail of *expansion* through take-overs, which could adversely affect availability of 'unnecessary' capital investment. Your plant may be under pressure to improve its *margins* through cost cutting, which could be positive from your point of view if your proposals will lead to significant reductions in energy use. However, the company may be trying to increase its short-term *profitability or return on investment,* which means its focus may be on ensuring that any investments produce a high rate of return - and that could work against any proposals on which the returns may be marginal or which may take time to yield a return.

Expansion plans may work for or against you. If these include plans to expand your own plant, this may lead to all kinds of opportunities to introduce energy-saving projects at the same time that new plant is specified and purchased. On the other hand, if expansion is planned, the company may be unlikely to agree to energy investments not seen as an integral part of a larger plan for new equipment.

Does your plant have a **site development plan,** aimed at ensuring its ongoing competitiveness and strategic viability, and including plans to bring and maintain equipment close to international best practice? If so, this is a major opportunity to introduce a *policy* regarding introducing the most energy efficient plant and equipment. If it doesn't have such a plan, have you carried out a **site energy audit** recently, to identify and prioritise the opportunities for energy investments? If not, then you should certainly consider this - indeed, an audit may itself be the subject of a well prepared proposal for expenditure, as the first in a series of steps aimed at identifying a programme of investments in energy saving. Indeed, arguably all energy investments should be preceded by such an audit and overall plan.

What about company plans for **new products** or changes in **product mix?** New product development can be extremely costly for firms, and can represent a major drain on company resources and even the readiness of senior management to give attention to other issues, including cost-cutting through energy investment. However, new products often call for new equipment, so that at certain stages in new product development there may be opportunities to ensure that any new equipment incorporates energy efficient technologies. Also, new products are very frequently introduced in order to move the company up the **value added chain:** meaning that the new product will sell for a higher price than other products, relative to the cost of its raw materials. Almost invariably higher added value goes hand in hand with increased input of energy - that is, the energy cost per unit output goes up. That can provide an opportunity to focus more intensively on means of reducing the energy input so as to improve the margin on the new product.

The above are just a few of the issues about which you need to gather information. The information you gather should be as *reliable* as possible, and it should be as *accurate* as possible. Be sure in particular to distinguish between **profit margin improvement** and **profitability**. Profit margin improvement means increasing the gap between the cost of production and the sales or transfer price:

Profit margin = [sales price] - [direct plus indirect costs of production]

So an objective to improve profit margin means that the principal aim is to increase sales price, or to reduce production costs, or both. Of course, there are many ways of achieving a profit margin objective, and reducing energy cost is just one of these. But because this objective is a relatively limited one, it may mean that the company will be ready to invest quite heavily if it leads to significant cost reduction - and remember that if profit margins are very tight, then a reduction in energy costs may actually lead to a very significant *percentage* improvement in margins.

An objective to improve *profitability* is different, because it concerns not just the margin you make on the sales of a product, but the investment required in order to make that margin. There are lots of ways of measuring profitability, depending on whether you include *all* of the company's assets (investment) or just some of them, and whether you measure it before or after interest and/or tax. Return on investment (RoI) is most often measured as the percentage return on total investment before payment of interest and tax, but not always. For our purposes here, let us simply note the distinction between profit margin improvement and profitability, and for the purposes of thinking about energy investments, let us think of the profitability of that investment as:

Return on investment = 100 x {[net annual savings]/[investment cost]} %

Finally, there is the need to maintain or improve **competitiveness**. This may mean reducing prices in line with competitors, or reducing costs to maintain margins compared with other plants in the company. Either way, it creates a positive climate for energy investments.

Business environment issues

Here, we are referring to the context in which your company is working. In relation to energy investments, the influences here are almost all good. Globally, there is more and more concern for environmental issues, and very few companies feel able to ignore the pressure to be, and to be seen to be, good citizens in relation to the environment. That means there is a generally positive view taken of any energy investment that will reduce emissions and/or otherwise have positive benefits for the environment and the company's image as a good citizen. Indeed, if you make significant changes to production processes or to the built environment, this may well be an opportunity for good public relations - and you should be prepared to capitalise upon it. It represents one of the benefits you can point to in your proposal.

In Ireland, as elsewhere, there are other, more 'hard-nosed' issues, which companies really cannot ignore - issues to do with the economics of using energy.

One is that **energy prices,** as we all know, have again risen sharply. Even the recent OPEC agreements on oil production levels have acted to ensure that oil prices remain stable at *high prices compared with a few years ago.* It is most unlikely that this situation will change to reduce oil prices sharply, in the foreseeable future. That means that energy prices generally are high and will remain high, and that in turn favours investments aimed at reducing energy costs.

Another is that government policy is now very definitely in favour of acting to curb energy use, as part of its commitment within the Kyoto Protocol. It must do this in order to meet its international obligations, and it has committed to early action. Both the *Green Paper on Sustainable Energy* and the *National Climate Change Strategy* adopt the "polluter pays" principle, which means that industry will have to assume its share of the cost of energy-related emissions.

What this means in practice is that society will have to participate in a regime of **energy taxation,** and that means that the cost of all forms of energy (except renewable/'green' energy) will become more expensive relative to the other input factors of production. Since taxation in any form is a matter of considerable concern to those who have to pay it, this can have an impact considerably larger than the absolute increase in energy price (just think of the lengths to which we will all go, within the law, to try to avoid having to pay taxes!).

It also means that some sectors of industry may participate in **negotiated agreements,** which will be directed towards accelerating the uptake of international best practice and technology. Sectors will be benchmarked against best world-wide practice, and will have to move towards it. That will create a climate very much in favour of utilising energy-efficient technologies wherever possible. The Climate Change Strategy states that these agreements should be in place in parallel with the introduction of a tax.

Also commencing in 2005 is a system of domestic and European **emissions trading.** What this means in effect is that companies will be issued with a certain number of emissions 'credits' at the outset, but will have to purchase any additional credits on an open market. The price of credits will be determined by the operation of the market, and the extent of demand. Of course, the credits that a company has will also have a market price and be capable of being sold if they are not needed. The impact of this on companies - particularly companies which are expanding, or in some way increasing their need for energy in production processes, is potentially enormous.

Finally, of course, there is the regime of licensing and schemes that are already pushing companies to take action to reduce emissions and take positive environmental action - such as **IPPC, EMAS** and the like. These issues cannot be ignored.

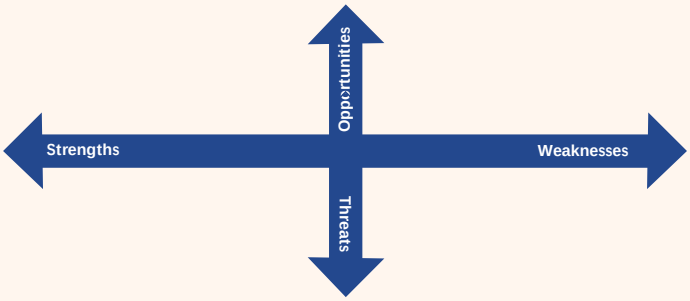
All of the above creates a climate for energy investment that is arguably more favourable than it has been ever before. It means that there are extremely powerful arguments that can be used - and capitalised upon - in proposals for energy investment. You are no longer simply reliant upon the straightforward and standard arguments about energy savings in a static world of stable energy prices and zero emissions costs. There are real arguments to be used that could impact on companies' growth prospects in the future - and *that* places energy and energy investments right in the middle of strategy!

Strengths, weaknesses, opportunities, threats ('SWOT')

'SWOT Analysis' is very well known, and most managers have participated in it at some time. However, it is very powerful from the point of view of strategic analysis. The fundamental approach is as follows:

Identify the strategic strengths and weaknesses in the company (or the plant/site) that either position it well for the future, or that create potential risks for the future. Identify the strategic opportunities and threats that face - or potentially face - the company now or in the future.

In particular, identify those *strengths* for which there are potential *opportunities*, and those *weaknesses* for which there are corresponding *threats*: these are known as **crucial factors** ('crux': cross):They are 'crucial' because they either represent strategic opportunities which the company is well placed to capitalise upon, or strategic threats which the company had *better* address if it is to survive.



Interestingly, at the moment energy investment to reduce use, cost and emissions often represents a crucial factor in both senses: there are opportunities for energy investment for which the company is or *could be* well placed to capitalise on, *and* there are threats in the energy/environment area which the company *ought* to address, and opposite which the company could be vulnerable. And these are very powerful arguments indeed to support an energy investment proposal.

You shouldn't hesitate to identify such crucial factors for inclusion in your proposal. Indeed, it is often better to include just a few very good and central arguments than to include too many, possibly weaker ones.

Gathering Financial Information

Like it or not, at the heart of an investment proposal is a financial assessment, and that requires you to gather as much reliable information as possible about the costs and savings likely to arise as a consequence of what you are proposing. We will look first at costs, and what type of costs should be considered for inclusion, and what costs should be *excluded*; next, we will look briefly at the savings/benefits side, before discussing how to produce a cash flow model for the proposal.

Costs

While you may only gather rough estimates at first, if you are making a serious proposal you really need to ensure that the cost data you gather is as comprehensive as possible. For a large project, you may make progressively more accurate attempts to gather this information, depending on the stage you are at in assessing and making the proposal. The following levels of estimates have been identified:

Order of magnitude: These are very rough estimates based on information already to hand, and are intended only to provide a 'ball-park' view of the project and its viability. Not suitable for any serious proposal, they are nonetheless extremely useful for the purposes of determining very quickly whether an idea is worth giving any time to at all.

Study estimate: At this level, you might obtain more accurate costs from potential suppliers of the major equipment, from a visit to a comparable installation, and from discussions with knowledgeable people.

Authorisation estimate: This is the level of accuracy that most serious proposals would require for an accurate financial appraisal. Most costs are known sufficiently well to enable an accurate assessment to be made. A serious deviation from these costs later on might cause eyebrows to be raised and questions asked.

Control estimate: At this level of costing, you will have obtained all of the costs on the project, other than any which have to wait for a certain stage in the installation before they can be determined.

Detailed estimate: This is the exact costing obtained from firm tenders, and after negotiations have taken place, on which purchase orders will be raised and invoices authorised for payment.

As indicated above, you would probably be expected to have figures at the 'authorisation estimate' level, for a decent proposal. For small projects, it may not be necessary to go beyond that level, even after authorisation, although of course firm prices will have to be obtained for major pieces of equipment.

The costs to be included in any proposal will vary from project to project, of course. However, the cost categories might include the following:

- **Purchase cost** of main equipment.
- **Cost of ancillary equipment** and equipment that would have to be replaced or modified in order to allow for the main plant to be installed.
- **Cost of fittings** needed for the work - valves, insulation, traps, etc.
- **Site preparation.**
- **Structural costs** - cost of altering existing buildings, and/or of any new building that may be required.
- **Installation costs,** including commissioning and trouble-shooting. If some or all of this will be done in-house, then this cost may be excluded partially or completely, although different companies have different views of this. Some companies consider that if a project takes staff away from other money-saving projects, then that represents an opportunity cost that should be included as a legitimate cost. In general, though, you can exclude internal costs that would be there anyway, whether or not the current proposal goes ahead.
- **Wiring, cabling, instrumentation.**
- **Making good.**
- **Downtime** or lost production time, if there is to be any - or alternatively the marginal cost of overtime that may be required to make up for downtime.
- Ongoing **increased running or maintenance** costs, such as additional staff or ongoing maintenance contracts.
- **Spare or replacement parts** which must be purchased and held in stock. This can be fairly significant with sophisticated equipment, and you should assess it carefully.

The above is not necessarily exhaustive, but it covers the main cost categories that would have to be considered in most energy investment proposals (energy costs are included in the 'savings' section below). You sometimes also have to include **opportunity cost,** if the project entails the use of equipment which otherwise would be sold off - in that case, the sales price foregone would have to be included as part of the overall cost, but this is rare in the case of energy investments.

Costs which are ***not*** included are:

Depreciation[1]**:** Contrary to the beliefs of many technical people, depreciation is *not* something to be included as a cost. In fact depreciation is merely a notional cost, used mainly in the annual report of the company to reflect the fact that assets lose their value over time. It also has an impact on the tax exposure of the company, since it is used to offset profits and hence the tax liability of the company. However, it is not a cash transaction. The exception would be if the proposal were to purchase a piece of equipment over a fixed period, and to sell it at the end for a second-hand or scrap price. However, this would be based on an estimate of what price you are likely to achieve from the market, and would count as a saving, in the year in which the sale is to be made. It is rare that you would include this at all.

Financing, finance charges, interest, or tax consequences[1]**:** These are included in the 'cost of capital' percentage figure used in the financial appraisal, and need not be included as a separate cost.

Sunk costs: Any costs that have already been incurred before the present investment decision. For example, if you paid consultants to carry out a feasibility study or technical assessment prior to making the proposal, this is a cost you have to pay anyway, whatever decision is taken, and for this reason you should not include it in your proposal [2].

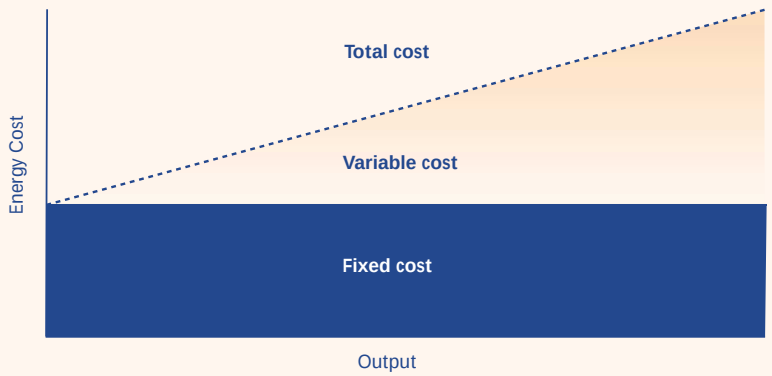
Typically, costs are incurred up front, at the outset of a project, and are one off.

Savings

The most obvious saving is that of **energy** - after all, that is what most energy-related proposals aim to do!

In assessing energy savings in a production environment, you often have to distinguish between **fixed** and **variable** energy costs - that is, costs which vary with the rate of production, and those that exist as a base load, regardless of the level of output. Although financial people usually know very well the distinction between fixed and variable costs, they often don't know how energy costs are divided between a variable and base element; indeed, many energy managers don't know either.

Figure 3.1: Fixed and variable energy costs



1 See a later section in this paragraph, where we say a little more about depreciation and capital allowances, in relation to cash flow consequences of corporation tax.

2 Nor should you take it into account in any way in assessing the idea. The 'sunk cost fallacy' - the notion that it is cheaper to go ahead than to pull out, because of what you have already spent - is very common indeed, and it is a fallacy. You can very easily end up throwing good money after bad, as a result of the sunk cost fallacy. This is worth bearing in mind in many different aspects of life, and not merely in the area of energy, or of financial proposals generally.

Figure 3.1 shows a graph of typical fixed and variable costs. The fixed cost or base load represents the cost of energy that is incurred even if production output is zero. For example, a furnace may have a fixed energy consumption that is incurred even when there is no production throughput. The variable energy cost represents the *additional* cost that is determined by the level of throughput. Total energy cost is the sum of fixed and variable costs.

Many energy projects affect fixed and variable energy costs: for example, insulation may affect the fixed cost element, but heat recovery may affect mainly the variable cost.

You can determine the cost graph for your own company by assessing total energy costs for two or more levels of production, and by extending the total cost line back to the y-axis - i.e., back to energy consumption at zero output. Where it intersects the y-axis represents the fixed or base load cost. You should be aware that very few situations are represented by a purely straight line, as shown in Figure 3.1, but this is usually a good enough approximation for most situations.

You need to know the extent to which any savings will affect both fixed and variable costs of energy. Some projects may involve *increasing* the fixed cost of energy, while having a significant impact on variable costs. Whilst this is good if it is believed that throughput will increase in the future, it can also be seen as a risk: energy costs could be increased if for some reason there is a downturn, or a period of production downtime for some reason. If your project is likely to increase fixed costs, you should examine it to see if there are any ways to reduce it, such as improved insulation, controls, etc. Apart from this, if there is a significant *variable* energy cost saving, you will need to estimate this on the basis of some reasonably realistic expected level of production output.

The other major issue to do with estimating energy cost savings is in relation to *price*. As we all know, energy prices are currently very unstable, and over any reasonable period of time they are likely to remain unstable, or become even more uncertain. With most purchases, you can assume that there will be a certain level of inflation that will affect all purchases and all savings (and the sales price of the goods produced in your plant) more or less equally - hence, later on we will suggest that you can generally ignore the effect of inflation. However, energy prices may not behave like other prices, and you may wish to build in a price variation, when assessing the likely annual savings in energy costs. In doing so, you may wish to take into account:

- Best estimates of future movements in oil prices (and consequent impact on other prices, such as electricity and gas).
- Likely impact of future taxation.
- Likely cost impact of emissions trading.
- Possible other costs associated with energy and environment.

However, in doing so, only take into account likely increases over and above general inflation. Also, don't spoil the case by assuming energy price increases that cannot reasonably be supported: others will be quick to spot an attempt to make a proposal look more attractive, by the use of unrealistically inflated energy prices. It may be better to be very conservative about energy prices - even leaving prices at their currently quite high level - in your main assessment, and including a further assessment that analyses the situation if prices rise at a rate significantly faster than inflation. This approach would be more likely to find favour among the management team than relying on large price increases to justify the main proposal.

Just as in estimating the total cost of the project, there may be other savings that you can include along with energy savings; these include:

- Lower costs associated with fuel/energy - for example, lower storage costs;
- Lower water costs;
- Lower maintenance costs;
- Less downtime;
- Increased production throughput;
- Improved quality and lower rejection costs;
- Increased flexibility leading to savings or increased revenues;
- Reduced floorspace and consequent reductions in heating, etc.

Of course, all of the above could also represent *higher* costs and, if so, you may have to return to your estimates of the project costs.

In general, most or all of the costs will be incurred at the outset of the project, while the savings will accrue over time.

Inflation

Allowing for inflation can be a tricky business. Particularly with projects in which the costs are incurred up-front, and the savings accrue over time, it can seem that if you allow for inflation, this will increase the savings as time goes on, and consequently the proposal will look better. However, this is false thinking for several reasons. For one thing, if you inflate the savings (or costs) over time, to make them appear bigger, then you should also include a consideration of inflation in deciding on what rates to apply in order to take account of the 'time value of money' (see next chapter for more on this): this would cancel out the inflation you have built in to your savings. For another thing, your proposal is in reality competing with other proposals, all of which are likely to be subject to the same economic environment, including inflation. So it is generally better to leave inflation out of your considerations, unless your finance department has some other policy on the matter. This is usually the case with all investment proposals, so that all are treated according to the same criteria.

The exception to this, as we have discussed above, is a possible increase (or decrease!) in energy costs that lie outside of inflation. As mentioned above, any such increases should be allowed for *only* to the extent that these exceed the general rate of inflation.

Project lifetime

If you assess your proposal only on the basis of simple payback (see next chapter), then the life you assume for the project is unlikely to matter (unless the payback period is so long that it exceeds the life of the equipment, which would not exactly make for an attractive proposal!). However, with other means of assessment the life of the project matters a lot, and makes a considerable difference to the financial analysis.

There are various approaches to deciding on the life of the project, including its **physical life,** or how long the equipment will remain physically useable, and its **technological life,** or the time to obsolescence (which may be determined not only by the rate of change of energy/equipment technology, but also by the expected life of products using the process in question). **Total lifetime costing** is also sometimes employed, on the basis of the costs and benefits over the entire life of the asset(s).

In general, you should aim to identify a reasonable estimate of the economic life of the assets - that is, the period over which you can reasonably expect to achieve the kinds of benefits contained in the proposal. This will be determined by the technological life of the equipment and by the rate at which your company's business is changing or expected to change. Your company may well have a policy on this, and you should discuss it with your finance department - especially, but not only, if you have any doubts. It is better to assume a shorter rather than a longer life, in most cases.

Building a Cash Flow Model

This is simply the process of tabulating all of the costs and savings associated with the project, on a time basis (normally on a year by year basis, over the useful life of the project). In reality, though, you will also include rows in the table to accommodate calculations you will make on the costs and savings, as part of your analyses. You may also develop different tables of costs and savings based on pessimistic, realistic and optimistic scenarios, in order to explore what the differences will be to the conclusions reached (and in order to reassure yourself about the robustness of what you are proposing). Nowadays it is useful to use a spreadsheet on a PC, both to tabulate the costs and savings, and to perform the analyses. Assuming that you are using a spreadsheet, it is normal to design the cash flow model so that each year occupies a different column, and the costs and savings are shown on different rows. This allows for easier assimilation by one's eye of cash flow items progressing, year by year.

The cash flow should be laid out along the following lines:

Figure 3.2: Typical cash flow model in a spreadsheet format

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4
Expenditure					
Investment					
Annual costs					
Total expenditure					
Savings					
Energy					
Other					
Total savings					
Net cash flow					
Present Value					

Of course, the various costs and savings may be expanded out considerably - and should be, in order to be able to see the impacts and changes of different cost and savings elements in the model. It is the convention to show the year in which the project starts as "Year 0", which is normally when the initial investment takes place. If capital expenditure occurs over a period of time, the expenditure shown in Year 0 is the amount to be spent in the first twelve months, that in Year 1 is the amount in the second twelve months, and so on.

Net cash flow is simply the difference in any one time period between total expenditure and total savings. And **Net present value** we will come to in a subsequent chapter.

The following simple example illustrates how this works.

Example - Synchronised switching unit

The following figures come from a large plant based in Ireland. Electricity costs were relatively high, and the energy management team identified the possibility of installing a synchronised switching unit between their ESB supply and their 20 kVA standby generator. They identified the following costs and savings:

Costs

Quotations were received for a synchronising switching unit. The total cost, including the cost of installation and commissioning, would be €35,000.
The company planned to switch in the generator for 2.5 hours a day during the 16 winter weeks - the period when they were being charged for electricity at the Maximum Demand rate. Costings were based on:

- Diesel oil cost of €0.21 per litre
- Generator oil consumption of 4.456 litres per 20 kVA
- A Maximum Demand for the period in question (allowing for power factor correction) of 993.8 kW
- A five-day week, at 2.5 hours per day, over the 16-week period;the estimated cost of diesel oil each winter would be €9,300/year.

Savings

For the period November to February, the company estimated that the average tariff for purchased electricity was €87,500. If the generator were to be used during the proposed 2.5-hour period each day during those months, this bill would be reduced to €63,300 - a tariff saving each year of €24,200. We assume that in the first year of operation, one third of these savings will be achieved (with one third of running costs incurred also).

There would also be a reduction in the number of kW units charged: based on Maximum Demand of 964 kW, and a cost per unit of €0.047, the estimated savings would be €9,060.

Figure 3.3: Cash flow

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Expenditure						
Investment (€)	35,000					
Annual costs (€)	3,100	9,300	9,300	9,300	9,300	9,300
Total expenditure (€)	**38,100**	**9,300**	**9,300**	**9,300**	**9,300**	**9,300**
Savings						
Tariff (€)	8,067	24,200	24,200	24,200	24,200	24,200
MD units (€)	3,020	9,060	9,060	9,060	9,060	9,060
Total savings (€)	**11,087**	**33,260**	**33,260**	**33,260**	**33,260**	**33,260**
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**

The above is a very simple example, and many others will be much more complex, from the point of view of the different cost and savings considerations to be included. However, it is perhaps typical of the kind of energy saving project undertaken. The costs and savings do require a certain amount of homework - perhaps more than is suggested when the figures are presented in summary form. However, producing the cash flow table is a relatively straightforward task, and it almost all that is required before proceeding to the financial assessment. We move on to the alternative approaches in the next chapter.

Some More on Depreciation and Taxation

We have already stated that depreciation is not included in the cash flow model. One reason for this, as we have said, is that depreciation is merely a paper exercise. Another is that in our cash flow model we enter the full cost of the equipment in Year 0. If we were to include depreciation as an annual cost to the company in subsequent years, we would in effect be imposing a double charge on the company. On the other hand, if we were to enter only some notional value of depreciation for each year, rather than the actual up-front capital cost, we would be ignoring the fact that the company really does have to make this full expenditure up-front, and we have to make our appraisal based on the full expenditure. So, as we have said, we do not include depreciation.

But depreciation can be something we have to take into account in one respect, and that is in relation to its impact on the tax liabilities of the company. If a company is profitable, it has a liability for corporation tax. It is able to reduce its tax liability by offsetting a specified percentage of its capital expenditure against its declared profits. The value of capital assets for the purposes of capital allowances is depreciated according to a specified method (and methods may vary, depending on the type of investment), so that capital allowances for tax purposes decrease year on year, as the assets are depreciated.

Capital allowances in effect reduce tax liability, which in turn represents a saving, and that saving should really be included in the appraisal.

Of course, the investment is itself intended to produce a saving, which in turn goes straight to the bottom line, and hence to taxable profits. These taxes on the extra profit represent a cost, which again should in theory be included in the appraisal.

So a capital investment has at least two tax effects, which should in theory be included as savings (in the case of capital allowances) or as costs (in the case of tax on extra profit).

However, these items are very often excluded altogether from an appraisal of project proposals. Most, if not all, proposals for investment in plant and machinery involve the same rules in respect of capital allowances, depreciation, and so on. This means that you can compare several alternative proposals without having to bother to include cash flow effects of taxation. In any case, the rules which apply to capital allowances do change quite frequently, and it would be difficult for a non-accountant to keep up to date with the current situation. So, even if your company does include taxation as a valid cash flow item, it is probably best to leave this to your accountants - or at any rate to work through this element of the proposal *with* them.

However, to summarise:

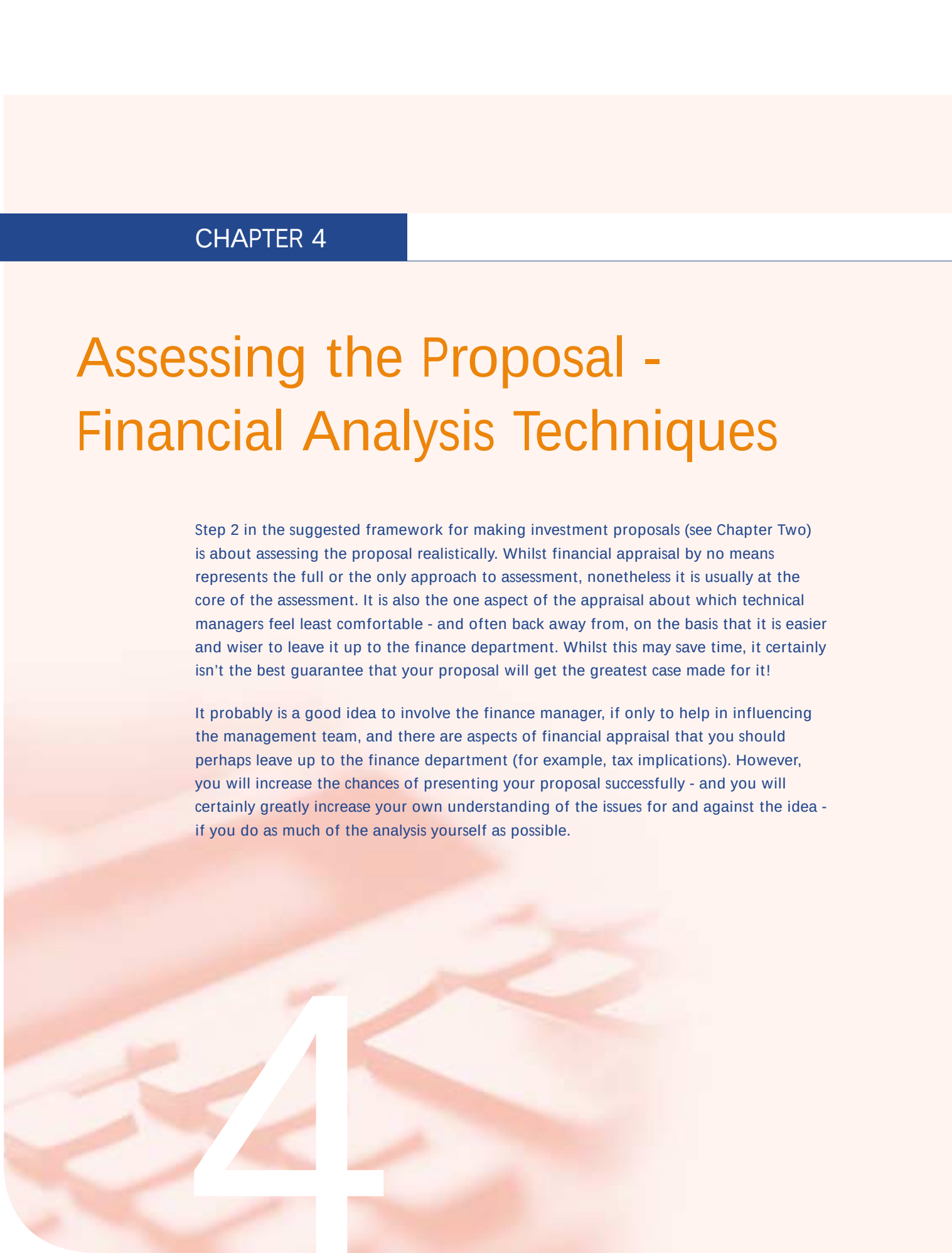
- *Depreciation is not a cash flow item. The only possible impact that depreciation might have on your proposal is in determining the amount and the timing of capital allowances for taxation purposes.*
- *There may well be taxation implications of your proposal. These arise from tax savings, based on capital allowances, and tax exposure, based on additional profits arising from the savings achieved.*
- *Most companies exclude these from their standard project proposal appraisal process. However, if your company includes them, or needs to do so for a large project, it would be better to explore these aspects with your finance department.*

CHAPTER 4

Assessing the Proposal - Financial Analysis Techniques

Step 2 in the suggested framework for making investment proposals (see Chapter Two) is about assessing the proposal realistically. Whilst financial appraisal by no means represents the full or the only approach to assessment, nonetheless it is usually at the core of the assessment. It is also the one aspect of the appraisal about which technical managers feel least comfortable - and often back away from, on the basis that it is easier and wiser to leave it up to the finance department. Whilst this may save time, it certainly isn't the best guarantee that your proposal will get the greatest case made for it!

It probably is a good idea to involve the finance manager, if only to help in influencing the management team, and there are aspects of financial appraisal that you should perhaps leave up to the finance department (for example, tax implications). However, you will increase the chances of presenting your proposal successfully - and you will certainly greatly increase your own understanding of the issues for and against the idea - if you do as much of the analysis yourself as possible.



In this chapter, we set out some of the more common approaches to financial appraisal - looking first at simple, non-discounted approaches, and then at the more common techniques involving a consideration of the time value of money.

It may be worthwhile pointing out at the beginning that these approaches are really quite easy! There is very little in the way of complicated mathematics or difficult concepts. This chapter aims to keep it all very simple, even if this means not being completely comprehensive in our treatment of the topic. With each approach, we comment briefly on the kinds of criteria that are often used. However, you need to check in your own case, to find out what criteria are considered acceptable.

Throughout this chapter, one simple case (involving a lighting decision in an office block) will be used for illustrative purposes.

ILLUSTRATIVE CASE - REPLACEMENT OF LIGHTING IN OFFICE BLOCK

Introduction

This simple case study is based on an actual situation in Ireland. Just one aspect of the situation is dealt with here but, even though the situation is relatively straightforward, it is a realistic one, and the techniques used in this chapter are basically the same as would be used in any other situation.

Background

The offices in question were built in the late 1980s, and are well maintained. They are heated using natural gas.

During the 1990s, energy use per unit floor area was reduced from 0.86GJ/m^2 to 0.62GJ/m^2 - a 28% reduction. Usage of electricity was reduced by around 25%. These improvements were achieved by:

- Improving time/temperature controls on the heating system;
- Installation of a comprehensive BMS system;
- Switch-off of (almost) all electrical power in the evening.

By 2000

- Electricity consumption of 706,560 kWh accounted for 81% of total energy cost in the building;
- Lighting (515,800 kWh) accounted for 73% of electrical consumption.

It was therefore decided to concentrate on lighting improvements.

Proposed action/estimated savings

It was proposed to:

1. Replace existing 4-lamp fluorescent light fittings with new (2-lamp) "M5" low brightness fittings - estimated power savings 68.0 kW.
2. Remove redundant light fittings - estimated power savings 14.4 kW. The total power savings, then, would amount to 82.4 kW. Based on an average use of lighting estimated at 2,750 hours/year, the above actions should lead to 82.4 x 2,750 = 226,600 kWh.
3. Introduce additional controls, in the form of 8 passive infrared sensors, and 96 pull-cord switches. These measures would yield further savings of 14,300 kWh.

The total estimated energy savings, then, would amount to 240,900 kWh.

Estimated savings/cost

The estimated value of the above savings would amount to €50,150/year. The total capital cost for actions 1, 2 and 3 would be €188,000, all incurred in the first year.

Example - Cash Flow Model

The cash flow model for our example is very simple, and is shown in Figure 4.1 below. The layout is identical to that suggested in the previous chapter (Figure 3.2).

Figure 4.1: Cash flow model for example to be used in this chapter

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Expenditure						
Investment (€)	(188,000)	0	0	0	0	0
Annual costs (€)	0	0	0	0	0	0
Total expenditure (€)	**(188,000)**	**0**	**0**	**0**	**0**	**0**
Savings						
Energy (€)	0	50,150	50,150	50,150	50,150	50,150
Other (€)	0	0	0	0	0	0
Total savings (€)	**0**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**

The only numbers you really need to bear in mind as we work through the various approaches are:

- *Initial investment (all in first year):*.....**€188,000**
- *Annual savings (no savings assumed to occur in same year as investment is made):*.....**€50,150**

The example has been kept simple so that you can focus on the methods, rather than on a lot of numbers.

Non-Discounting Appraisal Methods

There are two main methods of appraisal that do not involve interest calculations - namely:

- *Simple payback period;*
- *Accounting rate of return.*

Since these are very well known to most people, we will deal only very briefly with them.

Simple payback method

This is by far the most usual appraisal technique employed by managers - especially by technical managers who wish to avoid more detailed calculations. The *simple payback period* (often referred to just as *payback*) is achieved when the cumulative net cash flow turns from a negative to a positive figure (see Figure 4.2 below) - the cumulative cash flow for each year is obtained simply by adding up all of the net cash flow figures for each year *to the left* of the year in question. For example, the cumulative cash flow for year 2 is equal to 50,150 + 50,150 - 188,000 = -87,700. -87,700 is commonly represented in a cash flow table as (87,700).

Figure 4.2: Cumulative cash flow for lighting example

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Expenditure						
Investment (€)	(188,000)	0	0	0	0	0
Annual costs (€)	0	0	0	0	0	0
Total expenditure (€)	**(188,000)**	**0**	**0**	**0**	**0**	**0**
Savings						
Energy (€)	0	50,150	50,150	50,150	50,150	50,150
Other (€)	0	0	0	0	0	0
Total savings (€)	**0**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Cumulative cash flow (€)	**(188,000)**	**(137,850)**	**(87,700)**	**(37,550)**	**12,600**	**62,750**

So the cumulative cash flow here becomes positive between the third and the fourth years.

Of course, in this case the simple payback can be obtained in a much quicker way simply by dividing the total *cost* by the average annual savings. In this example, then, the simple payback is [188,000/50,150] = 3.75 years. However, in more complicated cases, where the investment is over a period of time, and/or where there are ongoing and perhaps variable costs in addition to the initial investment, and/or where the savings are not the same each year, then it is easier to use the cash flow table, and to estimate the payback by calculating cumulative cash flow.

In most companies in Ireland, projects are expected to yield a simple payback of perhaps 2 years maximum, and sometimes less. This is expecting rather a lot, and is perhaps more indicative of the competition for resources than of the real expected return on investment.

For the case in question here, the longer payback period of 3.75 years may be considered acceptable given that the investment is relatively low-risk and has a long life. Thus, the total period during which the savings can be expected - not shown by the simple payback method, on its own - and the riskiness of the expected returns, are considerations that should be borne in mind when making the overall assessment.

Accounting rate of return (return on investment)

This is simply the expected return on the investment, expressed as a percentage. Thus, the accounting rate of return is obtained by dividing the average annual savings by the total investment, and expressing the result as a percentage.

In our example:

Accounting rate of return = [(average annual saving)/(total investment)] x 100%

= [(50,150)/(188,000)] x 100% = 26.7%

Just as many companies expect a simple payback of 2 years or less, so they may expect an average return on investment of 50% or more. However, the considerations of longevity of the investment and the relative risk of the proposal should be taken into account here too.

Discounting Methods of Appraisal

The two basic approaches, using discounting (see below) are:

- *Net Present Value (NPV); and*
- *Internal Rate of Return (IRR).*

The two approaches are related to one another, and they are examples of what is known generically as *Discounted Cash Flow (DCF).*

Both methods take into account what is known as the principle of *present value*, or the *time value of money*. We will look at this before looking at the two basic approaches.

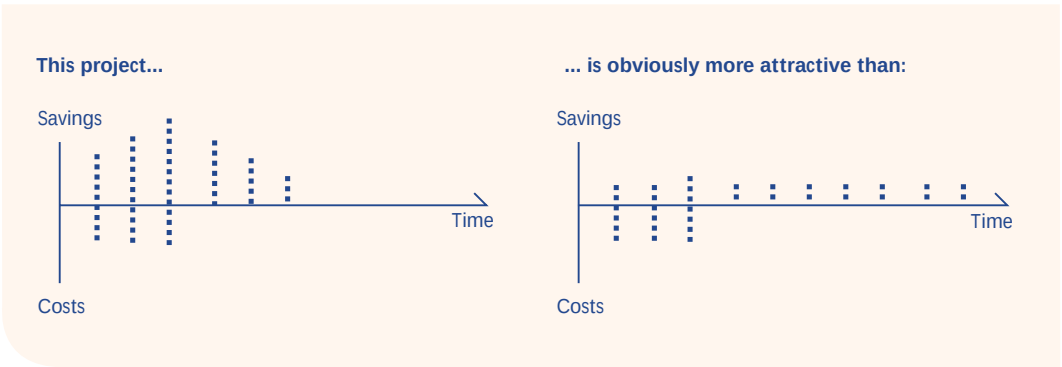
The time value of money

Most people would prefer to have money *now*, as opposed to receiving it *later*! This is the case even where there is no inflation (or where we ignore inflation in our calculations): money *now* can be *used* now - perhaps to earn *more* money, or to invest in further energy-saving projects, perhaps. The evaluation of projects should take account of this preference for money now rather than money at *some time in the future,* since companies too would prefer to have the returns now rather than have to wait for it (see Figure 4.3).

There is another reason why it is important to take account of the 'time value of money' (which is how this is referred to), and this is the principle of "equivalence". To compare one project with another in an equitable way, the finances of each project must be presented in such a way that each is *equivalent* to the other, in terms of its value to the organisation *now*. A project that leads to savings of €100,000 this year may or may not be better than one that leads to savings of €200,000 in three years' time. It is necessary to take account of the time value of money, in order to present these two alternative projects as "equivalent".

Of course, as the economist Keynes said, "In the long run, we are all dead". So a project that earns money (yields savings) in the short term will normally be preferred to one that provides a similar level of savings, but over a longer time period - unless, of course, you really *are* interested in the "long run" (as is sometimes the case with very large projects such as power stations or infrastructural investments). Many energy savings projects actually do lead to relatively small savings, but realised for a long time; such projects often suffer when the time value of money is taken into account, as we shall see. However, they often suffer even more when appraised only using the simple payback method.

Figure 4.3: The time value of money - money in the short term is preferable to money later on



Discounting

Discount rate

The process known as "discounting" is intended to take account of the time value of money. For the purposes of energy project appraisal, this almost always means converting "Future Value" of money into "Present Value", using an annual percentage figure to reduce or "discount" Future Value. This percentage figure is known as the "Discount Rate", or sometimes as the opportunity cost of capital, and it will be referred to in these notes as "r". "r" is a percentage figure, but for the purposes of doing calculations this is often written down as a decimal figure - hence, a value of r = 15% is often written - and used mathematically, as r = 0.15.

The Present Value will invariably be smaller than the Future Value - and the decrease depends on how far in the future the expected saving is to be. If you know the current Discount Rate (r) for your company, and if you know the Future Value and how many years into the future it will arise, then you can calculate the Present Value, or PV, using the equation:

Present Value = (Future Value) / $(1 + r)^n$

where: - r is the discount rate, written as a decimal;
- n is the number of years into the future in which the cost/saving in questions arises.

Those familiar with algebra will recall that the above equation may be (and often is) written as:

Present Value = (Future Value) $(1 + r)^{-n}$

where: - r is the discount rate, written as a decimal;
- n is the number of years into the future in which the cost/saving in questions arises; and
- the symbol $^{-n}$ is a shorthand way of writing $1/(1 + r)^n$

Where does the discount rate come from?

Put simply, the discount rate is the minimum percentage rate of return that the organisation wants to see from an investment. There are various ways that organisations have to arrive at a working discount rate. One is to find out the market rate of interest, if the money was to be borrowed, with a premium added to allow for the risk that the company is taking when it invests in a new piece of capital equipment (to cover the fact that things may not work out as had been anticipated). Another is to look more closely at the "Weighted Average Cost of Capital" (WACC), in which you work out a rate depending on the various sources from which the company obtains capital (equity, short term borrowing, etc), and the required return from each source; this can lead to an overall, or weighted, cost of obtaining capital. It can all become quite complex, since there is also the need to allow for risk. One theoretical approach is known as the Capital Asset Pricing Model (CAPM), in which a factor (known as Beta) or b is included as a measure of risk.

Happily, you don't need to know any of the above, unless you really want to. We aren't going to go into any of this theory here. The reality is that the way you obtain a working discount rate r is to go and discuss it with your finance people. They will advise you on what value of r to use. Normally it varies currently between a low of around 13% and a high of about 30 to 35% - though it can be lower, and it can be higher!

A word of comfort

If algebraic symbols bother you - and they bother many people who have left them far behind in their college years - then don't be put off by the above! The only things you have to know are (a) that Future Value is usually worth less than Present Value; (b) that Present Value is obtained by a process of discounting; (c) that discounting is done by applying a given "Discount Rate" to the Future Value. Apart from that, you don't have to do any calculations [although of course you can if you like, and it is quite easy to do so if you have a calculator capable of working out X to the power of Y (where X is 1+r, and Y is n)]. Instead, you can use a set of easy tables (see below) that will give you a Present Value figure very easily, and without any difficult calculations. We will come to this shortly.

Working out Present Value (PV)

As mentioned in "A word of comfort" (above), you don't actually have to do much in the way of calculating. Instead, you can make use of "Discount Tables" (a copy of which is provided at the back of this Guide), which makes the task very easy. Discount tables show different discount rates across the top row, and the number of years into the future down the left hand column. If you know the cost or saving in question, the discount rate and the number of years into the future that the cost or saving arises, then all you have to do is to find the appropriate "PV Factor" from the table. When you have extracted this, then all you have to do is to multiply the cost/saving by the PV Factor, to arrive at the Present Value:

PV = (PV Factor) x Cost (saving)

This may not give you precisely the same figure as you get by calculating it, because the tables only show the PV Factors to three decimal places; but it is as close as you need it for all practical purposes.

Examples of calculating Present Value

Example 1:

- *Let's just assume for the moment that we know that the discount rate for our company is 20%, or r = 0.20.*
- *Suppose a proposed investment will yield a net saving four years from now of €150,000 (ignore all other years for the sake of this example).*

We have two ways of approaching this - using the equation, or using the discount tables. Let's do both.

Using the equation:

PV = FV(1 + r)-n

In this case, PV = €150,000 x $(1 + 0.20)^{-4}$
= €150,000/$(1.2)^4$
= €150,000/2.0736
(using a calculator)
= €150,000 x 1/2.0736
= €150,000 x 0.482253
(again, using a calculator)
= €72,338

Using the discount tables:

PV = FV x Discount Factor

Use the discount tables to find the Discount Factor that corresponds to a discount rate of 20% and a time of four years: the Discount Factor in this case is 0.482; note that this is the same figure as you obtained by using a calculator and the formula, above, but given only to three decimal places.

So:

PV = €150,000 x 0.482
= €72,300

The difference of €38 arises because the tables are slightly less accurate, but perfectly adequate for most needs.

Example 2:

Here, let's use the simple case example of lighting summarised earlier. You will recall that the cash flow model was as follows:

Figure 4.4 Cash flow for lighting example (repeat of Figure 4.1 above)

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Expenditure						
Investment (€)	(188,000)	0	0	0	0	0
Annual costs (€)	0	0	0	0	0	0
Total expenditure (€)	**(188,000)**	**0**	**0**	**0**	**0**	**0**
Savings						
Energy (€)	0	50,150	50,150	50,150	50,150	50,150
Other (€)	0	0	0	0	0	0
Total savings (€)	**0**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**

We can simplify this even further, as the last row is all we are interested in:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**

For the purposes of arriving at the Present Value (PV) of the net cash flow for each year, we need to add two extra rows - one for the Discount Factor, and one for the Present Value:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Discount Factor						
Present Value (€)						

Let's assume, as in the previous example, that the discount rate to be used is 20%.

We will obtain the Discount Factors from the discount table, and we will obtain the PV for each year by simply multiplying the appropriate net cash flow for the year in question by the Discount Factor - as follows:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Discount Factor (r=20%)	**1.000**	**0.833**	**0.694**	**0.579**	**0.482**	**0.402**
Present Value (€)	**(188,000)**	**41,775**	**34,804**	**29,037**	**24,172**	**20,160**

It really is that easy!

What does it mean?

Let's just look for a moment at the results of the last example. With a discount rate of 20% (not uncommon), this means that the *present* value of the €50,150 annual saving has been reduced to less than half by year 4. It would be reduced to one third by year 6. If you looked at year 10, the €50,150 would have a PV of only €8,000!

This makes the point we were making previously: savings now are much better than savings *later on*. Of course, the converse also applies: expense later on would be much better than expense *now*; unfortunately, investment proposals normally entail spending the money up front, in order to obtain future savings.

As a final note, the fact that PV reduces so much as the years roll by means that it makes little enough difference to your case if you use a time horizon for savings (such as five years) or if you project the savings out to the full life of the equipment. In fact, if you were to look at the full life of the equipment, you would probably also have to add in refurbishment costs at some time as well, and these would counteract the ongoing savings. And looking at savings far into the future tends to make your case look more unrealistic - it is very difficult to say for sure whether a piece of plant will still be relevant, far into the future.

Using a spreadsheet

Easy as the discount tables are to use, it is often much easier - and much more flexible - to do the calculations using a spreadsheet such as Excel.

In this case, it is a simple matter to have the spreadsheet calculate the Discount Factor, using the following equation:

Discount Factor = $1/(1 + r)^n$

In fact you can easily have the spreadsheet work out the discount factor for several different values of r (use the 'Power' function to be found in the 'Formula' listing in Excel, using '1+r' as 'Number' and '-n' as 'Power'; for example, if r=10%, you would enter '1.10' as 'Number', and if n=5 years, you would enter '-5' as 'Power'). Of course, the PV can then easily be calculated by multiplying the Future Value (or Net Cash Flow) of each year by the appropriate discount factor.

Armed with all of the above, we can now tackle two common time-discounted appraisal techniques which, you may recall, are:

- *Net Present Value (NPV) and*
- *Internal Rate of Return (IRR).*

Net Present Value (NPV)

The Net Present Value (NPV) approach is easy. In fact, if you have been following the examples above, then you will discover that we are 99% of the way towards a complete NPV analysis.

The only *additional* piece of information that you need in order to do the NPV analysis is the *time period* over which it should be done. In other words, over what period do you take into account the annual costs and savings. This varies from company to company, and in some cases you will have to check with your finance department. An alternative approach would be to select a time period that seems reasonable for the proposal in question, given the context in which the proposal is being made. For a reasonable project in a reasonably stable setting, a five year time period might be considered reasonable; for a long term investment, you may decide on ten years; for a smaller, short term investment in a changing setting, three years might be better. In any case, you can always present your results for different time periods - and indeed that might be the most appropriate thing to do in many cases.

The Net Present Value is simply the cumulative sum of the individual PVs for each of the years in question. In this sense, it is the same as the cumulative cash flow that we did before, except that now the cash flows have been converted into present values.

Let's look at the previous example. You will recall that we already worked out the following:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Discount Factor (r=20%)	**1.000**	**0.833**	**0.694**	**0.579**	**0.482**	**0.402**
Present Value (€)	**(188,000)**	**41,775**	**34,804**	**29,037**	**24,172**	**20,160**

Now we only have to add a line for Net Present Value, or NPV:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(188,000)**	**50,150**	**50,150**	**50,150**	**50,150**	**50,150**
Discount Factor (r=20%)	**1.000**	**0.833**	**0.694**	**0.579**	**0.482**	**0.402**
Present Value (€)	**(188,000)**	**41,775**	**34,804**	**29,037**	**24,172**	**20,160**
NPV at year n (€)	**(188,000)**	**(146,225)**	**(111,421)**	**(82,384)**	**(58,212)**	**(38,052)**

Let us suppose that we had decided on a five year time period for the assessment. Based on the above, the NPV after five years is still negative - in fact, strongly negative, at (€38,052). The investment still hasn't recovered its initial capital cost.

Recall that the simple payback period was around 3.75 years. At the time, we said that while this is longer than most companies will find acceptable, for this kind of investment (stable, low risk) it might be all right. Based on a discount rate of 20%, it just isn't! In fact, if we were to extend the above table out in time, we would find that it would take around 7.5 years for the initial investment to be paid back:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
NCF (€)	(188,000)	50,150	50,150	50,150	50,150	50,150	50,150	50,150	50,150
r=20%	1.000	0.833	0.694	0.579	0.482	0.402	0.335	0.279	0.233
PV (€)	(188,000)	41,775	34,804	29,037	24,172	20,160	16,800	13,992	11,685
NPV (€)	(188,000)	(146,225)	(111,421)	(82,384)	(58,212)	(38,052)	(21,252)	(7,260)	4,425

Another way of saying this is that the *discounted (or dynamic)* payback period is 7.5 years.

This is one reason why companies insist on a very short simple payback period: if the savings are discounted, as above, then the real or discounted payback can be quite long even for projects with a short *simple* payback period.

In summary, for this project, based on a five year lifetime, the NPV is negative, at (38,052), and the proposal would not be likely to be accepted, *on the basis of a financial assessment on its own.*

Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) method is closely related to the NPV approach, above. In fact, it is based on the NPV approach, as there is no easy direct way to calculate the IRR.

Why use IRR rather than NPV? Well, many companies have no hard and fast rule about which discount rate to use, and a specific discount rate is needed in order to calculate the NPV. The IRR approach doesn't assume any one discount rate. Instead, the IRR approach is to work out the actual rate of return that the project will yield for the organisation over the agreed time period. Put another way, it is the *profitability* of the project over that period. The IRR represents the rate of return that the investment would have to earn if invested outside, or elsewhere in the organisation on an alternative project, in order to be a better investment than the project being proposed. The higher the IRR, the better the project.

As we mentioned above, there isn't a direct way to calculate the IRR. Instead, we calculate the NPV using different discount rates, and we find out which discount rate yields a net zero over the agreed time horizon. That is the IRR. Usually this requires trying a number of different discount rates, and perhaps interpolating between two - one yielding a positive NPV and one yielding a negative NPV.

As before, let's illustrate this with the lighting example, and again we will return to the time period of five years.

We already know that a discount rate of 20% produces an NPV after five years that is still negative - the discounted stream of savings isn't sufficient to cover the initial outlay:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	(188,000)	50,150	50,150	50,150	50,150	50,150
Discount Factor(r=20%)	1.000	0.833	0.694	0.579	0.482	0.402
Present Value (€)	(188,000)	41,775	34,804	29,037	24,172	20,160
NPV at year n (€)	(188,000)	(146,225)	(111,421)	(82,384)	(58,212)	(38,052)

Suppose we were to try a lower discount rate - say, 15%? The result is as follows:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	(188,000)	50,150	50,150	50,150	50,150	50,150
Discount Factor(r=15%)	1.000	0.870	0.756	0.658	0.572	0.497
Present Value (€)	(188,000)	43,630	37,913	32,999	28,686	24,925
NPV at year n (€)	(188,000)	(144,370)	(106,457)	(73,458)	(44,772)	(19,847)

Still negative, even with a discount rate of 15%! At this stage, we might be tempted to go no further with this proposal. However, let us persist, in order to find out at which rate the project breaks even. Next we try 10%:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	(188,000)	50,150	50,150	50,150	50,150	50,150
Discount Factor(r=10%)	1.000	0.909	0.826	0.751	0.683	0.621
Present Value (€)	(188,000)	45,586	41,424	37,663	34,252	31,143
NPV at year n (€)	(188,000)	(142,414)	(100,990)	(63,327)	(29,075)	2,068

At last! With a discount rate of 10%, the project breaks even - indeed, it yields a small surplus of just over €2,000 at the end of the fifth year.

If we wish to interpolate, we can do this quite simply by looking at the proportion of the change in NPV required to shift it from (19,847) (the NPV at 15% discount rate) to zero. Moving from 10% to 15% discount rate meant a difference in NPV of €19,487 + €2,068 = €21,915. That is, an increase of 5% in the discount rate meant a total movement in NPV of €21,915. In order to reach the "break even" (zero) NPV point, the NPV for r = 10% had to increase by €19,487. So we can interpolate between the 10% and 15% discount rates by using the proportion (19,487)/(21,915). That will give us the Internal Rate of Return:

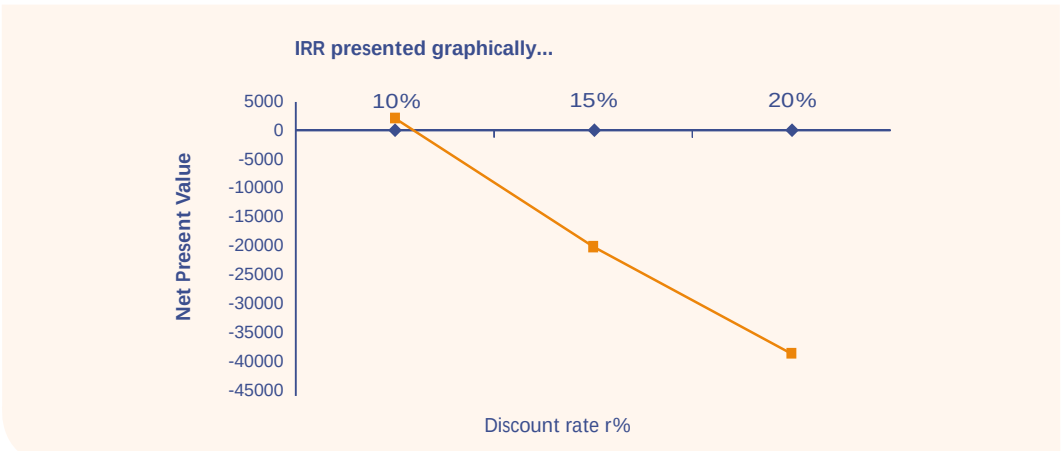
IRR = 15% - [5% x (19,487)/(21,915)]

= 15% - (5% x 0.89)

= 10.55%

We could also find the IRR by using a graphical method. All we need to do is to work out the NPV for 2 or more discount rates. We can then draw a graph of NPV against discount rate. The IRR is the point at which the graph crosses the zero point - see Figure 4.4 below:

Figure 4.5: Graphical representation of IRR
the IRR is the point at which the graph crosses the zero-NPV point.



Of course, the graphical method is not very accurate unless it is well drawn, and to scale. However, some people prefer it because it is a more 'intuitive' way of doing it.

So what does the Internal Rate of Return approach give us? For this example, what it means is that, taking a five-year life of the project, the rate of return from it is approximately 10.5%. For most organisations, this wouldn't be considered to be a wonderful investment - they could generally find other projects to spend money on that would yield a better return than that. It has to be borne in mind that this return will not be produced unless it can run for at least five years, and management has to have faith that there isn't too high a risk attached to the promised savings.

This doesn't mean that the project *couldn't* go ahead. In the end, it is a matter for management. It may be that they wish to be seen to be at the forefront of energy saving technology, and if there is no plant attached to the office building in question, this may be the next and most obvious approach to energy saving. And of course there may be other powerful arguments for proceeding; for example, the present lighting may be so inefficient that staff are complaining, and as a consequence action may be warranted, whatever the figures tell us. It is just that this analysis doesn't make the project look all that attractive, as the summary below shows us.

Summary of results based on the four approaches

Staying with the lighting example, we have produced the following four results:

1.	Simple payback period	3.75 years
2.	Rate of return	26.7 %
3.	NPV (r = 20%) (5 year time horizon)	- €19,847
4.	IRR (5 year time horizon)	10.5 %

Now, this never looked like a great proposal, on the basis of the kinds of criteria that many organisations use - at any rate, many private organisations. Private, profit-seeking companies often look for simple paybacks of 2 years or less, and Internal Rates of Return (and hence discount rates) of around 35%. Nonetheless, the proposal could well be of great interest to other organisations - commercial companies with offices as their major ongoing cost, for example, or public sector organisations not operating with the same profit motive. Added to that is the fact that the proposals are safe - the savings seem very secure, and the technology isn't going to become obsolescent for the organisation for many years. The life of the equipment is likely to be at least ten years. And, finally, as we have said previously, it may represent the next and most obvious step in moving towards having an office building that can be said to have taken all necessary steps to reduce energy consumption - particularly electricity consumption. So while the criteria may not commend the proposal to many organisations, it could still have many attractions for others - indeed, it could be very attractive for some.

This just goes to show that while financial criteria are important, they are by no means the only consideration. They should really be seen as but one of a series of criteria that should apply.

We mentioned risk. The level of risk attaching to a project proposal is something that we have to explore further, and will look at briefly, later on in the Guide.

A further example

Let us return to the cash flow model we developed towards the end of Chapter Three - you will recall that it concerns the installation of synchronised switching from mains electricity supply to a generator. The cash flow model developed was as follows.

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Expenditure						
Investment (€)	35,000					
Annual costs (€)	3,100	9,300	9,300	9,300	9,300	9,300
Total expenditure (€)	**38,100**	**9,300**	**9,300**	**9,300**	**9,300**	**9,300**
Savings						
Tariff (€)	8,067	24,200	24,200	24,200	24,200	24,200
MD units (€)	3,020	9,060	9,060	9,060	9,060	9,060
Total savings (€)	**11,087**	**33,260**	**33,260**	**33,260**	**33,260**	**33,260**
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**

Let's assume that the company has a strict policy of looking for a payback of not more than 2 years, and an IRR of 35% within two years of complete installation/ operation.

To identify the simple payback, let's look at the cumulative cash flow (note that because the savings are not the same in the first year, we can't simply divide the total cost by the annual savings):

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**
Cum cash flow (€)	**(27,013)**	**(3,053)**	**20,907**	**44,867**		

If we assume that the installation was paid for in the middle of year 0 (not unreasonable, maybe), then the simple payback is the sum of the following elements of savings:

Six months of Year 0:	€13,506	(half the annual savings, in year 0)
All of Year 1:	€23,960	(the total net savings in year 1)
Part of Year 2:	€3,053	(the balance remaining after year 1)

€3,053 represents [3,053/23,960] of a year of savings, or 0.13 years, which is just over 1.5 months (note that we might approach this differently, looking at when the savings arise in year 2, but in fact in this case €3,053 worth of savings will be achieved in the first two months, which is when the system will be in winter operation mode).

So the simple payback period is:

Year 0	6 months
Year 1	12 months
Year 2	1.5 months
	19.5 months, or 1.6 years

This may seem like something of a rigmarole, since most managers simply divide savings into cost, in order to obtain the simple payback; but it is often not quite as simple as that, and then it is necessary to refer to the cumulative cash flow. Note also that the start-up assumptions are critical, particularly where you are looking at short payback periods. Many companies will not allow for any savings to be claimed in year 0, for obvious enough reasons, and it is certainly best to be realistic and even pessimistic about when the savings stream will start.

Anyway, our simple payback of 1.6 years is well within the company criterion of 2 years, but what about the IRR criterion? In order to determine this, we have to try out different values of r, to find out at which value of r the NPV will be zero, in a three year time period.

Let's start with a discount value of 32% (the discount tables go up in twos) - just below the company's threshold of 35%:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**
Discount factor (r=32%)	**1.000**	**0.758**	**0.574**	**0.435**		
PV (€)	**(27,013)**	**18,162**	**13,753**			
NPV (€)	**(27,013)**	**(8,851)**	**4,902**			

Well, at r = 32%, the NPV is €4,902, which is positive (good). What about a much higher discount rate - let us try 50%:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**
Discount factor (r=50%)	**1.000**	**0.667**	**0.444**	**0.296**		
PV (€)	**(27,013)**	**15,981**	**10,638**			
NPV (€)	**(27,013)**	**11,032**	**394**			

Yes! Even at r = 50%, the NPV is positive, which means that the IRR criterion of 35% certainly is met! But what is the IRR for this proposal?

Let us persevere and try an even higher r, r = 60%:

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net cash flow (€)	**(27,013)**	**23,960**	**23,960**	**23,960**	**23,960**	**23,960**
Discount factor (r=60%)	**1.000**	**0.625**	**0.391**	**0.244**		
PV (€)	**(27,013)**	**14,975**	**9,368**			
NPV (€)	**(27,013)**	**(12,038)**	**(2,670)**			

Not altogether surprisingly, at an enormous r = 60%, the NPV is negative; so the IRR for this proposal lies between 50% and 60%. We can interpolate to find out where:

Difference in NPV between 50% and 60%: €3,064

Amount to cause NPV to become zero: €394

Then, the IRR will be:

IRR = 50 + [10 x (394/3,064)]%

IRR = 50 + 1.3%

IRR = 51.3%

In summary, then, we can say for this proposal that:

- *The simple payback period is 1.6 years (inside the criterion of 2 years)*
- *The IRR (after 2 full years) is 51.3% (well inside the criterion of 35%).*

Note that discounting does not necessarily lead to a worse proposal. The company's criteria here are less strict for IRR than for simple payback, and this project proposal fares much better, *against the company's criteria,* using IRR than using the simple payback method. So, if your company does have both criteria - or even if they don't - it can improve your case to use discounting methods. In any case, even if you don't do it, someone else may well do it for you, and they may not present the numbers in such a favourable light - particularly the estimated costs and savings in year 0. But, as a reminder, if you do propose to assume savings in year 0, make very sure that you can stand over your case, and verge on the pessimistic wherever possible.

Discounting methods really are easy. The hardest part is usually gathering the necessary cost and savings data - but then you should be doing that anyway.

We still have to think some more about risk, and we will look at that briefly in the next section.

Assessing Risk and Sensitivity

In this short section, we will discuss risk and sensitivity together, even though there are differences. We consider that the average technical manager doesn't usually need to go into the issue of risk at any great depth. We will touch briefly on both the quantitative and non-quantitative aspects.

Quantitative aspects

If you look in textbooks on financial appraisal, you will find a bewildering array of techniques for assessing risk. Some of these are quite straightforward, and some are very theoretical and complex. For our purposes, probably the only tool we need to consider is Sensitivity Analysis. This is very straightforward, and it has the additional virtue that it is easy to understand, and even easier to carry out, especially if you are using a spreadsheet to lay out the figures and to do the calculations.

The aim in Sensitivity Analysis is simply to assess the proposal in order to find out how its financial performance changes with changing assumptions. This is a wise thing to do, since you cannot always tell in any straightforward way how its performance will change if you have to change some figures - if the cost were to be different, or if fuel prices rose in the future, or if production output rose or fell. One very common use of Sensitivity Analysis is to assess the impact of inflation.

Another very good reason for using Sensitivity Analysis is that it really does allow you to become much more familiar with the effects of different cost (or other) elements on the financial performance of your proposal. This can sensitise *you* to issues of risk, or perhaps to the relative robustness, within your proposal. It can also prepare you for the "What if?" questions that senior managers so often put to the unsuspecting manager whose pet proposal is under scrutiny.

It should be pointed out that this is not *really* risk analysis, although there is an element of that in it. In reality, you can't know what all the risks are, and one of the reasons why many companies insist on very high IRR or discount rate hurdles is that they want to take account of an inherent riskiness attaching to *all* investments. After all, to some extent every investment you make in plant or equipment is an act of faith and it carries a risk. It is certainly more risky than buying safe stock, for example, and in some cases it may carry an extremely high level of risk - for instance, where there is uncertainty about the future market for your products, or about your current product mix. So high hurdle rates applied to IRR or discount rates are often intended to recognise this inherent riskiness.

Sensitivity Analysis, though, does allow you to assess the robustness of your proposal, against the possibility that some of your costs and/or savings may be 'flaky'. It's worthwhile to carry it out, and even to include some of the results in the actual proposal, since this can do a great deal to add confidence to the figures contained in the proposal. It should make you, the proposer, feel more confident as well.

We will illustrate this with reference to the example we have just worked through (the synchronised switching example, since the other example showed up poorly, anyway). Suppose that there is some doubt about the stability of fuel oil prices. The company is less sure that any fuel prices will be carried through to the cost of electricity, but it is very concerned that the world might be facing into a period in which the cost of fuel oil would escalate sharply; perhaps this has been exacerbated by government statements about taxation policies in relation to fuel for industry.

Clearly this could have major consequences for our proposal. After all, it is based on the notion that we can save on purchased electricity costs by running our generator for longer periods. We decide that one of our sensitivity checks will be on the robustness of our proposal in the face of inflating oil costs. We carry out this analysis on the basis of wishing to find out what level of fuel inflation could take place that would still allow us to meet the company's 35% IRR criterion.

We decide to perform the analysis again, on the basis of annual fuel inflation increases of 10% and 20%. If we have set this up on a spreadsheet, this is the work of only a few minutes. First, we look at a scenario in which oil costs rise by 10% per year:

	YEAR 0	YEAR 1	YEAR 2
Expenditure			
Investment (€)	35,000		
Annual costs[1] (€)	3,100	10,230	11,253
Total expenditure (€)	**38,100**	**10,230**	**11,253**
Savings			
Tariff (€)	8,067	24,200	24,200
MD units (€)	3,020	9,060	9,060
Total savings (€)	**11,087**	**33,260**	**33,260**
Net cash flow (€)	-27,013	23,030	22,007
Discount Factor r = 35%	1.000	0.729	0.533
PV (€)	-27,013	16,789	11,730
NPV (€)	-27,013	-10,224	1,506

[1] *Inflated at 10% p.a.*

We see that the NPV at end year 2 is still positive, which means that even with fuel inflation of 10% per year we can still meet the company's criteria.

Next, we try again, this time with fuel inflation at 20% per annum:

	YEAR 0	YEAR 1	YEAR 2
Expenditure			
Investment (€)	35,000		
Annual costs[1] (€)	3,100	11,160	13,392
Total expenditure (€)	**38,100**	**11,160**	**13,392**
Savings			
Tariff (€)	8,067	24,200	24,200
MD units (€)	3,020	9,060	9,060
Total savings (€)	**11,087**	**33,260**	**33,260**
Net cash flow (€)	-27,013	22,100	19,868
Discount Factor r = 35%	1.000	0.729	0.533
PV (€)	-27,013	16,111	10,590
NPV (€)	-27,013	-10,902	-312

[1] *Inflated at 20% p.a.*

This time we see that the NPV is negative. In other words, if fuel costs were to inflate at 20% per year, the proposal would then fail to meet the 35% IRR criterion. So what level of inflation would represent the ceiling? On inspection, it is much nearer to 20% than to 18%; so let's try again with an 18% inflation rate:

	YEAR 0	YEAR 1	YEAR 2
Expenditure			
Investment (€)	35,000		
Annual costs[1] (€)	3,100	10,974	12,949
Total expenditure (€)	**38,100**	**10,974**	**12,949**
Savings (€)			
Tariff (€)	8,067	24,200	24,200
MD units (€)	3,020	9,060	9,060
Total savings (€)	**11,087**	**33,260**	**33,260**
Net cash flow (€)	-27,013	22,286	20,311
Discount Factor r = 35%	1.000	0.729	0.533
PV (€)	-27,013	16,246	10,826
NPV (€)	-27,013	-10,767	59

[1] *Inflated at 18% p.a.*

Here the NPV at end of year 2 is just +€59, or very close to zero. We could continue, but this is probably close enough.

So, following this further analysis, we can add to our proposal the fact that not only does it meet the company's 35% IRR requirement, but it will do so even if fuel costs were to increase on an annual basis of slightly over 18% per annum. Not bad, and well worth the extra effort.

Of course, we could test other variables, in exactly the same way. Each time we would learn more about the dynamics of the proposal, and we would learn about the limitations of our proposal.

Non-quantitative risks:

We shouldn't need to say very much about non-quantitative risks attaching to the proposal, other than to draw attention to the fact that these always exist! Given that this is the case, you should try your best to:

- *identify them;*
- *identify the possible consequences;*
- *identify ways in which you would address them, if they arose.*

Perhaps the most obvious risk associated with technical proposals is that the technology won't work, or will require much more work and time in sorting it out than had been anticipated. However, you also have to look at other risks, such as the possibility that you will lose key suppliers or maintenance people, the chances that the products using the process in question will be withdrawn from your plant, and many other factors.

If you don't identify these, then you may be sure that others on the management team will - that's what they, and you, are paid for. You need to be sure that your proposal recognises and addresses any risks that could reasonably be expected to arise.

Concluding Note

It is the financial analysis that tends to cause the greatest difficulty for technical managers in preparing proposals. However, it shouldn't, because assuming you have gathered all of the likely costs and savings, the analyses are actually not difficult at all. Using a spreadsheet makes them even easier.

In reality - if it is done properly - preparing the proposal in such a way that it will be read and appreciated is a more difficult task, though once again it need not be. It is this task to which we will turn shortly. However, before you start to take the trouble to write the proposal, you need to start thinking about who you need to influence, when you need to influence them, and how. We will discuss this in the next chapter.

Annex to Chapter 4

Approaches to Financing

One of the major barriers to winning approval for capital projects in the energy field is a lack of availability of finance. This is perhaps a particular problem for energy, since many commercial organisations consider that investment in product or process R&D, investment in new product development, investment in new market development, or investment in additional capacity are strategically more important than investment in energy taken on its own. Of course this is one very good reason for piggy-backing energy projects onto other projects concerned with capacity expansion or general modernisation; but there are limits to the extent to which this strategy can be pursued. Inevitably, there are many energy projects for which capital is needed, and which cannot easily be 'tagged' onto other, apparently more strategic proposals.

By far the main source of funding is from the organisation's own capital reserves, or from its general capital-raising powers. However, sometimes there are other, more stand-alone avenues that can be explored. In this short annex, we simply mention a few of these; it is open to energy managers to explore these further, particularly when processing a large investment proposal, or one in which the returns seem marginal at best. We will briefly mention:

- *Financial institutions*
- *ESCOs*
- *Schemes and programmes*

Financial Institutions

The very *raison d'être* of financial institutions is to lend money, and they may be prepared to do so for any capital project on which there is a likelihood of reasonable security for the money lent, and the probability that the borrower will be able to pay it back. Banks and other financial institutions represent one of the primary sources of most companies' capital needs, apart from the capital raised from share offers.

There is no reason why financial institutions should not favour energy projects just as much as any other project. And indeed there is now a range of financial institutions in Ireland that are prepared to look favourably on a well - prepared proposal. It might be said that in particular work has been done to secure financial institutional backing for energy projects in the renewable energy field, but this interest could extend to large projects such as CHP and other significant, and generally stand-alone projects requiring substantial capital sums.

It would be exceptionally inadvisable for a technical manager - or any other manager, for that matter - to approach an institution to discuss a loan for a capital project, without the active approval of both the finance department and senior management generally. However, it should be a part of the energy manager's job to keep tabs on the kinds of 'deals' that financial institutions may be prepared to offer. For example, there are a number of institutions which will be prepared to discuss arrangements for sale and leaseback, in the case of major capital items, and you should at least keep informed of the possibilities.

Sustainable Energy Ireland maintains a certain amount of information on financial institutions which have shown some interest in supporting energy projects, and/or which have schemes in place. While it is probably true to say that most of the recent work in this area has been specifically in the renewable energy field, it is certainly worth keeping an eye upon.

Energy Service Companies (ESCOs)

Energy Service Companies (or ESCOs) can offer complete energy services to organisations, permitting the contracting-out of some or all of their energy management function to a company that specialises in this work. The kinds of services available include competitive purchasing of fuels; CHP; end-use efficiency measures, financing mechanisms, monitoring and tracking, and general energy management.

According to the ESRI[1], there are few such companies in Ireland thus far, and most of these would be involved with just a section of the activities listed above. The companies operating at present appear to fall into one of the following categories:

- *Provision and technical servicing of CHP facilities*
- *Facilities management (FM) companies dealing with a client's use of energy, water, cleaning and other services*
- *Contract energy management (CEM)*

One direction which ESCOs have taken elsewhere has been the provision of services with no up-front costs to the client. The ESCO manages the facilities to yield a cost saving, and this cost saving is shared between the client and the ESCO, producing a win-win outcome all round. Although an in-house energy management team might be more dedicated to the task of maximising savings for the company than an out-sourced agency, it may be in many cases that the expertise and resources to do so do not exist, and low levels of energy intensity may not justify a company's ongoing expenditure on resources to carry out full-scale energy management in-house.

Although the ESCO business is not well developed in Ireland at this time, there are some companies practising here. For example, one ESCO in Ireland provides a wide range of services, including high quality monitoring, tariff analysis, and project management, including design, build and handover. Others tend to focus more on large-scale investment projects, in particular CHP. Fees tend to be based on a negotiated fixed fee, rather than a share in the savings. Some, though not all, companies are associated with energy supply companies, and this may be an increasing trend, as electricity market liberalisation continues.

Once again, energy and other technical managers should aim to keep in touch with the development of ESCOs in Ireland, monitoring the kinds of advantages they might bring. Specifically in relation to investment proposals, ESCOs might provide an alternative source both of project funding and of project management. You might consider assessing a large project on the basis of financing and managing it in-house, and also on the basis of engaging the services of an ESCO.

1 Scott, Sue, Reducing Barriers to Energy Efficiency in Public and Private Organisations: Energy Service Companies in Ireland, Draft Report, Dublin: ESRI, August 2000. Much of the information on ESCOs derives from this source.

Schemes and Programmes

National schemes and sources of advice and support

The Government in Ireland is actively interested in promoting energy conservation (and renewable energy). Their Green Paper on Sustainable Energy, and the Government's response to Ireland's Kyoto commitments on greenhouse gas reduction - the National Climate Change Strategy, published in October 2000 - outline their commitment to energy efficiency and renewable energy, and to support for energy saving initiatives. The establishment of Sustainable Energy Ireland as a separate agency with greatly expanded resources is a key element in their planning.

Advice and support is available from bodies such as Sustainable Energy Ireland, and it is a good idea to avail of it. It can represent an independent, up to date and expert source of information both on relevant technologies and on approaches to funding. Check out www.sei.ie for full information.

During the 1990s, Sustainable Energy Ireland (then the Irish Energy Centre) was in a position to offer partial grants to companies for certain energy saving activities, through a number of grant schemes. For example, it offered some financial support for energy audits (under the Energy Audit Grant Scheme or EAGS) carried out by approved auditors. There was also a grant scheme (the Energy Efficiency Investment Support Scheme or EEISS), which provided financial support for projects involving selected "priority" energy technologies. Both the EAGS and EEISS have now been discontinued, as the national programme under which they operated has come to an end. However, it is possible that in the future there may be other schemes aimed at providing support for selected technologies - thereby accelerating their penetration into the Irish market. It is also worth mentioning other schemes, such as the Boiler Awards Scheme, also operated by Sustainable Energy Ireland and offering support and advice in important areas of energy management. For larger companies, the Large Industry Energy Network provides a network of information, training, and self-help to member companies, along with a means of reporting annually on energy savings targets and achievements.

EU programmes

EU energy programmes offer a potential means of gaining financial support for major projects, although it should be noted that in recent years the practical opportunities for gaining funding for energy technologies in industrial processes are very limited.

The largest programme of relevance is Europe's Framework Programme; the 6th Framework Programme (FP6) is currently underway. FP6 has energy technology as one of its specific programme elements. It supports RTD on a wide range of energy technologies, but industrial processes are not among these. However, if your business is the development of *energy technology*, then FP6 has possibilities.

The instruments within FP6 have in the main been designed to advance the European Research Area (ERA); within the ERA, it is hoped that there will be a single market for RTD in Europe, with considerable sharing of research facilities, opening up of national research programmes to organisations from other Member States, and possibilities for greatly increased mobility of researchers throughout Europe. The new FP6 instruments (Integrated Projects and Networks of Excellence) are designed to encourage movement towards the ERA wherever improved coordination would be likely to improve effectiveness. The budgets and work programmes for both these instruments are expected to be very high, and in practice the only prospect for an Irish firm is in becoming a partner in a contract led by another firm. It is vital for Ireland that participation levels within FP6 remain at least as high as in previous FPs, even though this may be difficult. Participation as a partner rather than as a leader is very likely the path most Irish firms will choose.

Also within FP6, the more traditional RTD proposal will still be entertained. These are now known as Specific Targeted Research Projects (STREPS), and although the budget for these is rather limited, it nonetheless offers the possibility of proposals for smaller projects.

Funding levels in FP6 vary, but may be expected to be around 25%.

In common with all EU programmes, FP6 requires that proposals be submitted as transnational projects; that is, proposals made by a consortium of partners from different Member or Associated States.

One other EU programme to be aware of is the *Intelligent Energy for Europe* (IEE) programme, operated by DG TREN and not DG Research. This is a new programme at time of publication, and the first Call is expected shortly.

You should be aware that IEE is much, much smaller than FP6, and in general projects are in the 'softer' areas of energy efficiency and renewable energy than the technology focus of the Framework Programmes. However, they are potential sources of support for 'soft' projects in areas of energy management; topics such as M&T, for example, have received support in the past, within the predecessor of IEE (SAVE).

Calls are published each year, with priority areas being shown for the Call. Unless your idea lies within a priority area, you may as well save your time and energy - the proposal will not be accepted.

You can obtain full information on FP6 (Energy) at the following European Commission websites: For information on the Sixth Framework Programme generally: *http://europa.eu.int/comm/research/fp6/index_en.html*

For the current work programme for FP6 (sustainable energy systems represents one element in the work programme), download from:*http://www.cordis.lu/fp6/infrastructures.htm*

For information on DG TREN generally, and on the IEE programme in particular (including access to current Calls and work programmes/priorities), start at: *http://europa.eu.int/comm/energy/index_en.html*

To Repeat: A Word of Warning

As mentioned above, you should never travel very far along the road of exploring alternative/independent means of sourcing funding for projects, without first discussing and clearing it with senior management, including the finance department. There may be strict internal policies on this, and you could find yourself inadvertently in trouble if you proceed without authorisation.

CHAPTER 5

Developing an Influence Strategy

You may recall that in Chapter Two we suggested that you should see the task of influencing as an ongoing task. For this reason, it isn't really just "Step 3" in the five-point framework described in that chapter; it should start right at the beginning, and it needs to continue right through to the point at which the proposal is accepted - and beyond that point.

It would be possible to write a complete book on this topic alone. Here, we will simply confine ourselves to a few remarks and suggestions which we hope will help you to increase the chances of having your proposals accepted.

Why Bother with an Influence Strategy?

You may feel that your proposal is - or should be - good enough to stand or fall on its own merits. That tends to be the case particularly when you have lived with it for a long time, have invested a lot of thought in it, and discovered that it looks attractive from an economic point of view.

Well, maybe it should be good enough to manage on its own. Sadly, proposals rarely are. In fact, the very best of ideas often get shot out of the water at a really early stage, for apparently inexplicable reasons; naturally, to the proposer, these reasons always seem unreasonable, while to the manager(s) making the decision, they are the very essence of rationality.

There are all sorts of reasons why your proposal may not be accepted. These might include some or all of the following:

1. It really was a pretty bad proposal, whatever you may have thought about it. The figures you produced may not really have stood up, and the likely returns were not as good as you thought they were. Hopefully the previous two chapters will have helped you to overcome this, but maybe not.
2. It was a bad proposal because it was badly presented. The figures were good, but their inherent goodness just didn't shine through the proposal you wrote, which was too short, badly laid out, full of errors, confused, and full of jargon. Hopefully the chapter after this will help you to sort some of these issues out.
3. There were too many risks attaching to it. The returns you suggested were an over-optimistic statement of what was likely, and there were too many technical or financial or other risks associated with it.
4. The technology was regarded as too "cutting-edge", which is another way of saying that it was considered too risky. Maybe you didn't show (because you thought it was obvious) that every other factory on your estate has the technology already.
5. The technology was considered as not "cutting-edge" enough for your progressive company.
6. There were other proposals that were just much better - or seemed that way to the management team.
7. Money was too scarce, and the priority given to your ideas was too low.
8. Nobody understood what you were proposing to do (this is very common with technical proposals).
9. There were other proposals - less attractive financially, but "sexier".
10. People just didn't seem to *like* your proposal.
11. People just didn't seem to like *you*, or to 'rate' you highly enough.
12. Other proposers seemed to have the ear of those who mattered, and it was as if the whole matter of selection was a *fait accompli* before you even started.

The above is a mere selection. That list isn't just given for fun, though - those reasons really do crop up for technical managers.

Problems with the analysis, and/or with the written proposal, can be sorted out, and hopefully this package will help you to do so. But problems that arise because your proposals or the whole energy area don't seem to get enough attention can be more difficult. *It is part of your ongoing job to make sure that your area does get the attention and priority it deserves.*

We suggest that there are three main headings under which you should consider this whole influence business (there are more, but we will try to keep it within reason here):

1. **Creating a context in which your proposals will be treated seriously.**
2. **Knowing the rules of the game in which your proposals will be judged.**
3. **Maximising your own levels of influence within the organisation.**

Create a context in which your Proposals will be treated seriously

Let's face it. Technical matters are often not considered to be the most profoundly important things in many companies - at least, not when things are working smoothly, and product is being produced at reasonable cost and quality. There are some exceptions to this, but it's a general rule that seems to apply. And within the technical area, energy tends to have an even lower profile.

Of course, it's the job of the energy manager to see that the profile for energy is raised in the organisation. Energy costs are usually not considered to be an important cost item for any one manager, and often the cost of energy used in a department isn't even a budget item on which the manager's performance is judged.

The following are probably obvious enough pointers to most full-time energy managers, but let's just re-iterate them anyway - they are all intended to raise people's concerns with energy and energy use, and to create a climate in which the management team will take energy sufficiently seriously to give reasonable consideration to energy-saving proposals.

1. **Raise the profile of energy and energy costs in the organisation**

   Of course this is something you will do on an ongoing basis, but it is important to think of promotion of the energy 'agenda' as a marketing exercise, with the management - the decision-making - team as the 'market'. You need to think of the energy messages that you should convey on an ongoing basis - the significance of energy as a cost item, the impact that energy use could make on profitability, and so on.

2. **Target the areas in which investment proposals could be made**

   Consider making special - short but punchy - reports to the management team about areas in the company where it is most vulnerable to energy costs; where there is a need, and scope, for energy cost saving projects; where technology is moving along generally so that the company could capitalise on advances. The idea here is to prepare management for a proposal in these areas - indeed, to get management to seek proposals in these areas. Remember that if senior managers believe that a proposal arose because of their own insights, it is much more likely to receive a positive reception. You, the energy manager, will also be seen as having had the foresight to have known what was in the senior manager's mind all along (provided you act promptly enough on any demand from senior management for a proposal).

3. **Provide briefings on technologies and approaches you would like to pursue**

   On an ongoing basis, it is a good idea to provide very short and very straightforward examples - short caselets, perhaps - of the kinds of technologies and applications you may consider including within proposals. These should not be too frequent, but sufficient to maintain awareness of the possibilities.

4. Keep management informed of key national issues that will affect future operations

You should provide briefings to the senior team on important environmental issues that are likely to face the company in the short to medium term future. These may include likely volatility in energy prices; succinct information on the impact of the National Climate Change Strategy within Ireland, and in particular on your plant; information on issues such as energy taxation and emissions trading, and their likely impacts; and environmental regulations and how energy projects should fit in with actions to address environmental priorities and regulations.

5. Try to have policies in place regarding energy efficiency

Many companies now have as a written policy that they will seize every opportunity to ensure that they employ best practice technologies and approaches in their operations, when it comes to energy use. If such policies are in place, it can enormously assist in advancing energy saving projects.

It is also a good idea to ensure that all new plant and equipment will, as a matter of course, be specified so as to provide maximum energy efficiency.

6. Use energy audits to identify opportunities and present priorities

Most companies with sizeable energy bills have periodic energy audits carried out. Sometimes these are seen as the preserve mainly of the energy and other technical managers.

However, they also present opportunities to demonstrate to the senior team that there really are possibilities for cost-effective energy investments. Also, they can be used to place priorities on a variety of energy investment options. Carried out by expert third parties, they also convey to others that the ideas for investment have come from impartial, independent observers.

It is a good idea to present summaries of such audits to senior management as discussion items - not presenting the whole audit, but rather well edited summaries of the key/important issues raised.

7. Report on the success or otherwise of previous energy investments

We will return to the issue of what to do after the investment has gone ahead, in a later chapter. However, it is worth mentioning here that you should always report back to senior management the results of previous energy investments - providing details of how the project performed versus how it was predicted to perform.

It is worth doing this even if the performance wasn't as good as you had expected. After all, presumably you too will learn from any mistakes or over-optimism, and being open about it lets other managers see that you have learnt. You can also rectify any mistakes in future proposals, and this will usually help to raise confidence in you, rather than to lower it.

The above is not exhaustive. But the point is that you should set out a plan to ensure that the internal climate within the senior management team is such that they will be receptive to proposals to spend money on energy efficiency. Without such a climate, you can hardly expect them to be enthusiastic about your ideas.

All of this may sound obvious, but surprisingly it is very rarely done in a planned way. Managers need to market themselves and their areas and priorities, and they need to have a definite plan for doing so.

Know the 'Rules of the Game' in which your proposal will be judged

Most managers *do* have a reasonable idea of the policies and procedures used by their plants in assessing and deciding upon investment proposals. However, there are often two quite separate 'systems' in place - one of them formal and stated, and the other one informal and often quite difficult to work out. To be successful, you need to know whether there are indeed two separate processes at work, and you need to be able to 'work' these processes.

1. The formal system - knowing the capital budgeting process

Most companies have a capital budgeting process, though this may be either formal or informal. An *informal* process would be one in which each investment proposal is assessed on its individual merits, without any set capital budget having been set aside. Following approval, management either remembers to include it as an investment item for the next planning period, or finds the capital from somewhere whenever this is feasible.

Increasingly, though, companies have a more formal capital budgeting process, in which a capital budget is agreed for the coming year. Investment proposals are put forward from all over the company's management team, and each one is screened. The total number of proposals is thus reduced to a smaller number which (a) seem to represent a good fit with the company's overall strategic objectives and plans, (b) promise a reasonable return, and at the very least a return that matches the company's investment criteria, and (c) provide a reasonable spread of projects for the company.

The number of projects left after the review process will normally be a function of the quality of proposals received and of the size and limitations on the company's capital budget. Within a multi-plant company - particularly an MNC - there may also be other, more arcane issues at stake, of competition between plants and even countries, or of really long term plans known only at senior level in corporate headquarters.

Many companies have a threshold capital value for different sizes of proposed investment. For example one company in Sustainable Energy Ireland's Large Industry Energy Network has three different procedures, for different levels of proposed expenditure, as follows:

< €5,000:	Only basic proposal required; may be funded ex Revenue budget, authorised by Energy Manager.
€5,000 - €10,000:	Proposal must be submitted on a "Delegated Authority" form, including details of the proposed project, a justification, and a financial evaluation (simple assessment carried out by proposer, while finance department do discounted calculations). The proposal is approved at General Manager level, and if approved the money is put forward for consideration in next year's Capital Budgeting process.
> €10,000:	The same process as above, but more detailed, with a more detailed form. The approval is not delegated to the General Manager, but rather it is presented to the Capital Expenditure Committee (actually, recently replaced by the site senior management committee), chaired by the CEO. If it passes here, it will be presented by the General Manager to the Board for approval.

So it really is vital to know the process, and what is involved. Also, because normally you wish to avoid delays - and if you miss the boat you may have to wait for another year! - you should make sure you are aware of the timing of the whole capital budgeting process.

Of course, the process varies from company to company, and in some cases it is all much more flexible than that. However, in some MNCs, it is a lot *more* complex, and the ultimate decisions are taken off-site by people you may not know.

2. The informal process

The reality is that the above are the *procedures*. In parallel with those procedures, the organisation runs along on much more informal lines. If a proposal for a major capital expenditure is received into the system, there will normally be a set of informal consultations prior to the discussion. These consultations may or may not include you, and of course they may or may not be positive for your case.

It is important for you to know who within this process talks to whom, and who tends to carry a lot of influence in the process. Of course, the most senior manager is likely to be the most influential, but not necessarily. It may be that a technical proposal will be discussed informally with the senior plant manager, for example (assuming that that isn't you), or maybe with the financial controller. It may also be that there is an informal system of vetting and opinion seeking that accompanies the more formal system, where notes or emails are exchanged about significant proposals.

Knowing this more informal system is important, and accessing it is even more important. You need to know who the important actors are, and you need to take the time to ensure that they understand the background to your proposal, and why it is important. In other words, judicious lobbying can sometimes be necessary, to achieve a successful outcome. *In some cases, though, this is discouraged, and if this is the case you may do yourself damage; this is where a good and accurate knowledge of the informal rules of your organisation's culture is vital.*

Maximise your own levels of influence within the organisation

It would be possible to write a whole book on this topic alone, and we will only touch on a few ideas here. You should regard these as ideas that you might work upon in order to ensure that your level of influence in the organisation is as high as possible. *Remember that organisations do not necessarily run on wholly logical lines, and that decisions are often not taken solely on logical argument - or at any rate that logical argument is often the means by which a decision is justified, rather than the basis of that decision - odd, but true.* Remember also that, even if your proposal is really compelling, there may be other proposals that are equally compelling - in a situation where there are two different but identically compelling proposals, it will be the level of influence that the proposers can bring to bear that will sway the decision in the end. What else is there?

1. Sources of power in organisations

Although "power" is sometimes thought of as a 'dirty' word these days, it is still true that our ability to influence derives from the power we possess. Power itself derives from a variety of sources, and it is worthwhile reviewing these - partly so that we can assess our own power and ability to influence (and hopefully work at building this ability), and partly so that we can assess the structures of power and influence within the organisation - particularly in relation to maximising the chances for our proposal. Some of the more ubiquitous sources of power include the following:

Position: This is the authority that has been vested in you by virtue of the title and position you hold in the organisation. It is often said nowadays that this has been greatly devalued - and many senior managers like to stress this - and indeed organisations do tend to be more and more informal these days. Nonetheless, position still confers both a mystique and a level of authority on the holder to a much greater extent than we care to admit. We may nowadays call the general manager by her or his first name - but we also keep close to the front of our minds that these people retain an extraordinary ability to affect our positions. All right - they don't have the same ability to hire or fire that they once had - but their opinion still carries a great deal of weight.

That's why we need to make sure that we direct influence efforts about pet projects such that they reach the 'right' people in the organisation. We also need to assess the level of power our own position confers on us. This may (or may not) be quite high in relation to those more junior to us in the organisation, but it may not be very high in relation to our more senior managers - or indeed in relation to colleagues at the same level in the organisation.

Identification is another source of power. By this we mean the extent to which people identify with us, or see us as similar in some way. Thus, a marketing and a sales manager may see great similarities between one another, by virtue of the kinds of work they do. A production manager and a technical manager may be the same - or may not, of course! Sometimes identification arises from non-work characteristics such as age, interests, social status, personality, and a whole range of different things

We should also be aware that sometimes people don't want to identify with others, if they see them as being too low in influence, or even possessing negative influence. The reason for this is obvious - such negative influence may rub off on associates.

This is an important issue. Within organisations, it is possible to 'map' the power structures between people. These often don't mirror the formal structure, but rather they tend to be determined by the levels of interdependencies between people's work goals and between people's personal aims and ambitions and concerns and fears. You will often be able to determine this by observing who spends time with whom, and for what. Knowing this can help in deciding a plan of action for ensuring that you get the messages you want to the most appropriate people.

Ability to reward or punish is often thought of as being closely linked to level in the organisation, but in reality it often isn't. There are many people in quite low levels in the organisation who can wield enormous power - just think about the person who could expedite or hold up your expenses payments, for example! In most cases these days, reward and punishment are about ability to release or hold back resources of one kind or another - of course these can be physical resources or they can be emotional.

This is not just a silly, academic point. The reality is that in all organisations there are interdependencies between people: people need others, in order to achieve their personal and work goals. These interdependencies force co-operation and often compromise: we scratch others' backs, and we hope that they will scratch ours, too.

Again, the reality is that many issues are agreed in organisations of all sorts through people reaching 'deals' with others. "You see me right, and I'll see you right" is often played out as "you support my proposal, and I'll support yours" - or sometimes as "you don't support me, and I may not support you". Does this seem nasty? Yes, maybe - but it happens, and we need to recognise that it happens. In fact, it should happen, provided that everybody is working towards a set of over-arching objectives that are ultimately concerned with the welfare of the organisation. That is how politics work - whether large-p politics within countries, or small-p politics in organisations or even departments.

Information is another major source of power in organisations. People who can acquire useful and relevant and accurate information can use this to bolster their positions. That's why spending time on staying up to date and informed with developments in the energy and environment field generally is so important - and keeping abreast of developments related to the kinds of energy saving proposals you make is especially important. Networking with colleagues, and keeping in touch through networks such as Sustainable Energy Ireland's Large Industry Energy Network, are important means of doing this.

Expertise is a really important source of power. It's different from knowledge, and more powerful. The person who is seen as the real expert is one who - in the right situation - can wield enormous power. This is particularly the case when the problem to be solved is a very important one, and when you're the expert with the answers.

It should be the aim of every manager - every worker - to develop his or her own area of expertise - slowly, quietly, surely, over time, and in a planned way. That is your real power base, and one you can carry round with you. Of course, if your expertise is in an area nobody cares about, then it doesn't count for too much, but when you link expertise with an ability to 'market' the importance of your field of operation, then you have real power!

Finally, *social skills* represent a really important source of power. A part of this is the elusive 'charismatic' power that some people seem to have. Another part, though, is the equally powerful ability to empathise

with others, to listen to others, to understand others' needs and concerns, to see their emotions and fears, to help them to see the best in themselves.

It is sadly the case that many technical - and highly qualified - people are not that socially skilled. Indeed, they are not infrequently intolerant of other people's perspectives, or lack of knowledge, or ability. On the other hand, the technical person who can combine real expertise with real social skill is one who carries an enormous amount of power.

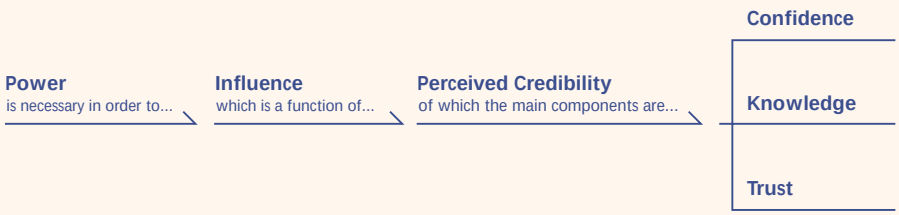
These, then, are what you have to work with. You can assess others' power in the organisation by assessing them under these headings. You can assess your own power in the organisation by honestly assessing yourself. It is important to do so if you are to have any real chance of getting your ideas across, and of getting your proposals accepted. *Remember that organisations do not work in solely rational ways!*

2. Your ability to influence

We have looked at some of the sources of power, and we have said that power is a prerequisite to being able to influence. Let's just develop this a little bit further.

A number of writers have pointed to the need for power in order to influence, and have gone further by suggesting that influence itself is a function of ***perceived credibility,*** such that:

Figure 5.1 The components of personal influence



Your ***confidence*** is determined by many things, including your conviction that you are right in what you assert, and your *expectation* that you will succeed. Of course, false confidence can be misplaced, but even people who are on very unsure ground often win through by stressing confidence (you only have to look at politicians to see this working - and to see its limits, too, of course). Expectations are vitally important, and they can work positively and negatively for us, because they tend to create self-fulfiling prophecies.

We have touched on ***knowledge*** before. Sufficient to stress here that the more honest analysis you carry out on your ideas, the more in-depth will be your knowledge of its strengths and weaknesses. Hopefully, if you have identified many weaknesses, you will *either* have modified the proposal so as to reduce these, or you will have decided not to proceed. It may be that further research will provide you with more knowledge, and this will either help you to improve the case, or confirm that you should not proceed.

It is often a good idea not to parade all your knowledge right up-front. Only show as much as you need to. This means that if the going gets tough you still have something in reserve.

Finally, there is the issue of ***trust.*** Your proposals will be receive a favourable or otherwise reception depending on the extent to which people feel they can trust your word and your judgement. In general, trust is slow to build and, once destroyed, very slow to recover (though actually there are many cases where trust is given very easily, and takes a lot to destroy - in such cases, though, if it is lost it may never be recovered. This is often the case where trust is given to a person because of a position they hold; if they abuse that

position too badly or too frequently, trust is lost forever, as is respect for the position, whoever else may occupy it in the future). It is your track record that will generally speaking determine the level of trust that people have for you in the organisation.

If you can assess your and others' positions of power accurately, and if you can work to develop perceived credibility through well-founded confidence, a sound knowledge base, and a track record of trustworthiness, then you increase your chances of success enormously.

Some Specifics

With all the above as background, let's finish off by suggesting some pointers that may be of assistance in influencing positively the outcome of your energy investment proposal.

1. **Present the best proposal you can**

   You should work on the principle that you will never present a sloppy or an incomplete proposal. This doesn't mean, of course, that a proposal for a €500 purchase will be presented with the same level of analysis as one for a €50,000 investment - the actual depth of analysis, and the length of the proposal should be appropriate to the size and importance of the investment proposed. The point is that you should always aim to make the proposal - short or long - read well, clearly, and generally be the very best that you can do. If you can't achieve that - perhaps for time reasons - then perhaps you should consider delaying it.

   We will explore the presentation of the proposal in much greater depth in the next chapter.

2. **(Almost) never present a proposal that shouldn't succeed**

   A general rule should be that if you are in serious doubt about a proposal, then you should not present it - or at least you should defer it until your own doubts have been allayed. There are at least three reasons for this. First, if you have doubts yourself, then you are unlikely to be a good advocate for it (and your confidence won't be very high - see above). Second, if you think it is 'dodgy,' then the chances are that someone else will too. Third, if your proposal is seen as bad, and it fails, you will lose credibility. Indeed, if it scrapes through and it is bad in practice, you will lose even more credibility!

   We say "almost" because there may be times when it is wise to present a proposal that will not succeed, on the basis that you have another, much more important one that you really do want to succeed. Sometimes the management team will be reluctant to fail two proposals in a row - though this can be a dangerous game to play, of course. Sometimes also you will be required to present a proposal that you know in your heart to be bad, but you have to present it anyway. In such cases, always try to persuade yourself that you may be wrong and the proposal may actually be worthwhile - then present it as strongly as you can. That will win friends, and if it all works out you may well get the credit.

3. **Do your homework**

   Before presenting the proposal, try to find out what objections may be raised by influential members of the decision team. If you can anticipate these, then you may be able to find ways of neutralising them.

4. **Find allies**

   Try to ensure that your proposals address other people's needs and concerns, as well as your own. Seek synergies and win-win outcomes.

5. **Sell face to face**

   Influencing is almost always a face to face process carried on over a period of time. Don't leave it up to the written proposal on its own.

6. **Do your homework**

   We have stressed the importance of rigorous analysis. The more you do, the more confidence you can have, and the more confidence you deserve to have.

7. **See influence as part of your ongoing job**

   Be aware that influencing is an ongoing task, and be prepared to give it as much time as it needs. Without influence, you will be unable to do your job as energy manager; so this may be the most important aspect of your job.

8. **Raise the profile and importance of energy and environment**

   We devoted a whole section above to this topic. This too is a key aspect of your job. You are supposed to 'represent' energy and environment to the senior team. It may be, of course, that there are other managers who have responsibility for aspects of this; in this case, make sure that you work as a team rather than in competition.

9. **Know the formal and informal processes for proposal vetting**

   Once again, we devoted a whole section to this. Don't leave it up to others to know this, or indeed to take responsibility for your proposal - even though at some point another senior manager may be expected to take it over. Always make sure that you are "in the loop", and keep tabs on where the proposal is, in the system, and how it is doing.

10. **Whatever the decision, be prepared and ready to follow up quickly**

    If the proposal is accepted, your planning should be such that you can move as quickly as is permitted in implementing the proposal. It rarely pays off to wait to let people change their minds.

    If the proposal is rejected, try to find out why, and what would have been needed to make the proposal more acceptable. Try to find out whether there are ways in which it could be re-pointed so as to make it more acceptable.

    Finally - and we will touch on this in the final chapter of this Guide - if the project does go ahead, then monitoring and reporting on its progress - failures as well as successes - represents a key part of your work. It will also help to raise your profile, and to raise your perceived credibility.

Concluding Note

In the next chapter, we will be looking at the presentation of the proposal - both as a written document and as a verbal case. Inevitably there will be some overlap with what has been written in this chapter.

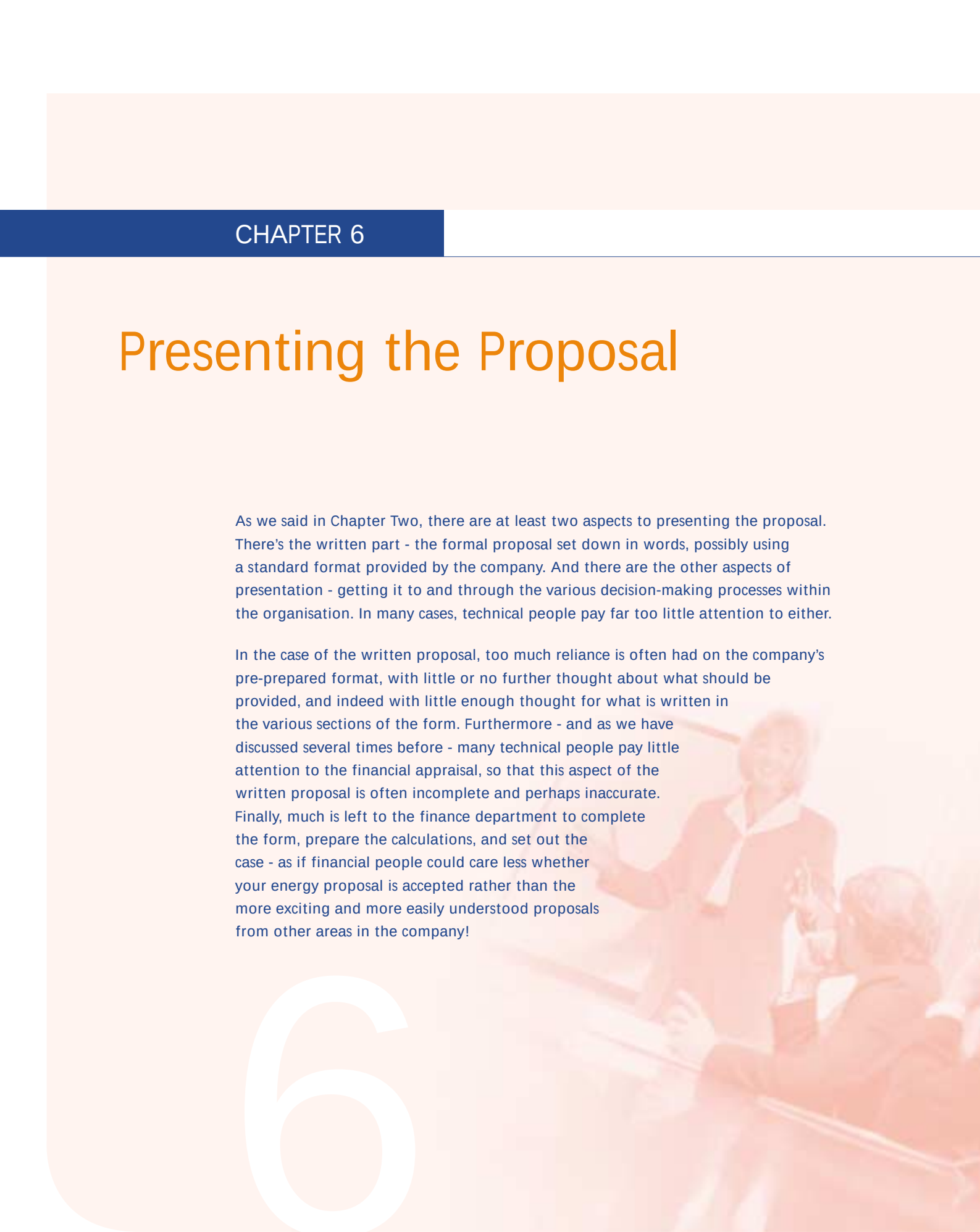
However, few enough managers take time out to think about just how much or little power and influence they have within the 'system' - or how well connected with the 'system' they are. Although this doesn't just apply to capital investment proposals, it most certainly is directly relevant to making successful proposals. This shouldn't be surprising: power and politics are most frequently directed at the acquisition and use of resources, and that is the whole purpose of investment proposals. In making a proposal for an energy investment, you are competing for scarce resources. Thinking about how you can influence the process will greatly increase your chances of success.

CHAPTER 6

Presenting the Proposal

As we said in Chapter Two, there are at least two aspects to presenting the proposal. There's the written part - the formal proposal set down in words, possibly using a standard format provided by the company. And there are the other aspects of presentation - getting it to and through the various decision-making processes within the organisation. In many cases, technical people pay far too little attention to either.

In the case of the written proposal, too much reliance is often had on the company's pre-prepared format, with little or no further thought about what should be provided, and indeed with little enough thought for what is written in the various sections of the form. Furthermore - and as we have discussed several times before - many technical people pay little attention to the financial appraisal, so that this aspect of the written proposal is often incomplete and perhaps inaccurate. Finally, much is left to the finance department to complete the form, prepare the calculations, and set out the case - as if financial people could care less whether your energy proposal is accepted rather than the more exciting and more easily understood proposals from other areas in the company!



When it comes to actual presentation of the proposal, via face to face meetings, presentations, discussions, and the like, again this is often left up to other managers. Technical people are often uncomfortable about having to discuss such things with other senior managers - and why wouldn't they be uncomfortable, if they haven't completed their financial analysis homework; or if they haven't created arguments in favour of the idea that are capable of being understood by someone without a double-PhD in engineering!

But this is like getting someone else to make your marriage proposal for you. You can never be sure that they will put the arguments in your favour very well; you don't know that they will put their hearts into it; they will find it difficult to convey your own very real ardour and conviction; and you can never be absolutely certain that they mightn't have their own hidden agendas - which may not match your own! Of course, sometimes it just is not possible for you to represent your proposal in person, but at the very least you can try to make sure that whoever will present it for you understands, believes in and is committed to the idea.

We will try to provide some brief ideas about both aspects of presenting the proposal. We can't be too prescriptive: it's clear that each organisation does have its own procedures, and of course it is important to follow these. So if at any point in what follows we seem to conflict with your company's procedures, then proceed with great caution - almost always, it is your company's procedures which should be your guide. But even then you should be able to use them to best advantage.

The Written Proposal

We will make a few introductory points here, before suggesting a structure to follow in writing your proposal.

First, not every investment proposal will require every conceivable analysis: you have to use your judgement (perhaps with a little advice sought from people who know, within the organisation), about how much detail to include.

Second, despite what we have said previously, you may well be able to 'contract out' much of the preparatory work - either to another department, or to someone in your own department. And again the rule of selectivity must apply: only include what you *have* to include, to make a good case. However, the real point of this guidance package is that even if you don't do all the work yourself, you should *understand* it, and in particular *understand* what it tells you about the proposal.

Third, it is worth taking enough time to ensure that you have the proposal well laid out, legible, well presented and clear. This does *not* mean that you have to present it in multi-colour detail, with expensive visual aids. Rather, it means that you should take the time to ensure that you have set it out so that the arguments can be followed easily by a layperson, and with a minimum of time or trouble. Assume that people don't really *want* to read the proposal. A thin, inviting, well-written proposal will be much more likely to get attention - and approval.

Fourth - and this is a really important point that you should consider carefully for *any* project that will be expensive, potentially contentious, or complex in its considerations - full proposals can take a lot of time. You should carefully consider doing it in two stages. You might consider putting forward an outline proposal, with a request for agreement to continue working on the project, and to bring it back for final consideration at a later date. This can save you a lot of time, but it can also act as a very good means of influencing senior management, through involvement at an early stage.

It is just worth mentioning here that, if you do make a two-stage proposal for a contentious change - one that people might disagree strongly over - it is often very useful for a meeting to have one session in which everybody fights and 'gets it off their chests', followed by another in which the full proposal is made but with some obvious concessions made to the most powerful objectors. So a stormy initial meeting should not cause you to lose all hope.

The overall structure of the proposal

Assuming that you don't have to follow a 'pro-forma' procedure in making your application, then it is up to you to decide how to lay it out. Even if you do have to follow a set procedure, you can often supplement it by adding short and to-the-point annexes, which set out further information or analyses to support the proposal. Either way, a useful structure for setting out a written proposal is the following[1]:

- *Executive summary*
- *Background*
- *Options*
- *Capital costs (timed but non-discounted)*
- *Savings (indication of timing, but non-discounted)*
- *Results of financial appraisals (including possibilities for advantageous financing, financial support, etc - if any)*
- *Uncertainties and sensitivities*
- *Other considerations (non-financial benefits; risks; other considerations)*
- *Best option*
- *Proposed means of tracking performance*
- *Request*

Below, we offer some very brief notes on some of these sections. Some don't need further explanation, so we offer comments only where this seems warranted.

Executive summary

This shouldn't call for very much comment. However, it is worth making a few points about it.

1. Since it is just about the only section that everyone of any importance will read, it is the most important part of the proposal. This doesn't excuse you from writing rubbish elsewhere, but it does mean that you need to take special care to get this section right.
2. It should be written *after* you have written all the rest of the proposal.
3. It should be a real summary - not simply an introduction. It should aim to cover all of the *main* points of the proposal.
4. In general, its sequence and general layout should follow the main proposal, although this isn't absolutely mandatory - sometimes it is clearer if you change the layout/sequence a bit, to make the summary more readable or clearer - but do this as little as possible.

1 This overall structure is partly based on Investment Appraisal for Industrial Energy Efficiency, UK: Energy Efficiency Office, Guide 69, 1993; and Economic Evaluation of Energy Efficiency Projects, Brussels: European Commission Thermie programme Maxi-Brochure, nd.

5. It definitely shouldn't be too long! A summary that is as long as the proposal isn't a summary. However, make it as long as it needs to be - often a full page is adequate to cover a proposal of around 15 pages in length. Many people use a smaller font, and single line spacing, to fit more in, and this is acceptable provided it doesn't end up unreadable.
6. Make absolutely certain that your request, and the basis for it, is clearly set out and obvious. There should be no shilly-shallying over a decision one way or the other, if your proposal has a definite request in it.
7. The summary should be capable of publication and understanding if taken on its own. Given that many people will read only the summary, this is important. Also, many investment selection processes entail all proposals' summaries being separated from the detailed proposal, and bundled together as a set of summary working documents - so make it look good and read well.

Background

This section is important. Technical staff should remember that the people taking the final decision about a project may not realise its importance simply from a description of the proposed installation - indeed, such a description might only serve to put others off or to confuse them. Rather, the project needs to be related to the business, as the decision-makers see it. Senior managers may not be engineers, and any engineering concepts may need to be described in simple terminology. In addition, even where senior managers *do* have technical backgrounds, they are often not familiar with energy saving techniques.

A background section outlining the problem the project intends to solve is therefore essential. It should explain the reasoning behind the solutions being put forward, and it should be written in language that the decision-maker will understand. But bear in mind also that the decision-maker doesn't have all day to read the background. Keep it succinct and to the point. Lay it out well, and clearly.

Options

It's essential that your proposal shows that other, possibly cheaper options have been explored before coming down on the recommendation being made. Senior management expects this of their engineers, and engineers' professionalism is depended upon in order to produce the correct designs and make the correct assumptions.

Having said this, the Options section should not explore every option in depth. It should simply highlight other potentially viable options, and give succinct reasons why these might be good or not good.

If there are some options that seem more or less equally as good as the one you're recommending, then you may need to show the financial analysis results for these also. However, you are probably expected to exercise your judgement such that a clear recommendation is made. So in presenting the options, you need to seem relatively impartial so that it doesn't look as if it is a 'snow-job'; on the other hand, you need to be careful not to oversell some solution which you really know is much less good than the preferred option.

You need to be particularly careful when you are writing a proposal for a senior manager who is a real expert in the area, or a really experienced engineer, who really enjoys digging into the technical problems that were a part of a previous job. Such people often want to take a technical proposal to pieces, in order to demonstrate that they know more than you do. If you have such a situation, you should consider writing the options in such a way that there are some issues still open for the senior manager to explore and find his/her way through - hopefully arriving at the best possible conclusions. In other words, provide some food for thought for such a person, and food that will be rewarding and productive for the senior manager to chew over. And of course such people are often pretty wise about these matters, so that some informal prior consultation may often be advisable, if it can be arranged.

Other considerations (non-financial issues, etc)

Some texts stress only that you should point out the non-financial *benefits* here. However, there may also be issues and problems associated with the project, and you need to be able to show that you have identified them, recognise them, and can deal with them. So here you are showing - in summary form - what the benefits are, and what any problems might be and how they can be resolved.

Non-financial benefits might include the following:

- *Ways in which the project can improve how the business meets health and safety or environmental protection regulations;*
- *Synergies with other environmental programmes or activities;*
- *Quality improvements not directly quantifiable in money terms;*
- *Impact on future flexibility, such as ability to adapt for changes in product mix, etc.;*
- *Impacts on the workforce, such as skill requirements, better working conditions, etc.;*
- *Impact on downtime, improved maintenance schedules, reliability, consistency, etc.;*
- *Potential impact on future issues such as energy taxation, negotiated agreements, etc.;*
- *Improved security of energy supply;*
- *Internal corporate opportunities - whether it meets overall corporate or other policies, whether it offers potential for internal PR, etc.;*
- *Opportunities for external PR;*
- *Possibilities for extension/expansion;*
- *Other advantages conferred but not financially quantified - such as improved management information flows.*

Best option

The best option should follow clearly from any comparative options included in the proposal. It should be set out clearly and concisely.

The form of installation, how the whole project will be proceeded with, and the kinds of agreement that can be entered into with the equipment suppliers, should be described in such a way that senior management can understand and appreciate it.

Proposed means of tracking performance

A section on tracking performance is rarely included in investment proposals (though it is increasingly common to find a lot of emphasis on this in other settings - such as proposals for projects to EC programmes). It makes a great deal of sense to include such a section. To do so will gladden the hearts of both general and finance managers, who invariably believe that other managers make proposals based on entirely fictitious proposed savings that never really materialise.

You need to be able to answer the question "Exactly how will you be able to convince us that this proposed project of yours actually produced the savings you're claiming now?" which is just the kind of question that Chief Executive Officers like to ask just when you're settling back and thinking it's all going your way. If you can answer that question - or, better still, if you can convince senior management that you care about the question and have addressed it, then your proposal will be well on the way to acceptance, and you will be well on the way to promotion. So it is worth taking some time to think over.

What it boils down to is having the ability to measure performance *before* and *after*, in terms of energy performance (and all the other benefits you have been so careful to point out in your proposal). You *should* have been in a position to point to the "before" data - after all, presumably that's what your whole analysis is based

upon. But are you also in a position to measure and track the changes? If not, how will *you* know whether the thing worked or not? Maybe the cheap addition of a bit of metering will give you that ability - and more besides.

One of the advantages of addressing this question is that it also forces you - in a very practical way - to address another related one: "Exactly what do you mean by performance, in this case?" Your appraisal should have answered that question - just in case it hasn't, maybe you need to go back and do some more work on it.

Request

When all of the above has been done, all that remains is to state clearly what decision(s) are needed, and by when; how much money and other resources are required, and when; what actions will be taken in the short term, on approval (you may have included a more detailed but reasonably outline project plan in an annex).

Presenting the Proposal

The proposal approval process

In many organisations within SEI's Large Industry Energy Network - and these are probably typical of large, modern organisations - it is clear that there are reasonably firm established means by which investment proposals are brought to a final decision. Typically, these depend on the size of the proposal: a small proposal for around €5,000 expenditure might simply be listed as an intended action, within the normal budgeting process for the department. However, a large proposal would either have to follow a standard procedure for the capital budget - perhaps accompanied by a short form - or to go through a more formal, separate investment proposal process. This process might involve some or all of the following:

- *Proposer completes an investment proposal form, having gathered data and carried out simple financial consideration (for example, payback);*
- *Form goes to higher manager for consideration. If approved, finance department develop further analyses, with extra data supplied by proposer;*
- *Higher manager brings proposal to senior management meeting;*
- *If approved, proposed investment included in capital budget, or money sought from corporate finance, or decision passed to corporate level for signing off.*

From discussions with technical managers, and observation of what happens, most technical proposers make it their aim to 'pass the monkey' just as soon as humanly possible, in the proposal-making process. That is - get the boss to take responsibility for it straightaway, if possible - let the finance department crunch the numbers and make the case - let the boss present the pros and cons of the proposal - let the boss argue it over - and just see what 'comes back down' on it. There are many virtues to such an approach. It saves considerable time for the proposer - and of course even more time if the proposal isn't accepted anyway, in the end. It reduces workload. It avoids having to stand up and make presentations to senior managers who know nothing about energy technology.

Sadly, those advantages are counteracted by the depression and stress of having your pet proposals turned down all the time. There is also the drawback that you might not be seen as a 'winner' by the company - not very influential. And it just doesn't help energy management if proposals are delayed for a long time, or stopped altogether.

The technical manager's involvement

It should already be evident that a value held dearly within this Guide is that you should do as much of the data gathering, analysis, and proposal preparation as you possibly can. This will acquaint you very fully with the project; you will become an expert - nobody will know more about the subject than you will, or about its good points and its possible pitfalls and how to avoid them. That is a great strength and a great source of confidence.

So another principle that we state here, as forcefully as possible, is the following: **Seek every opportunity to represent your proposal to others, right through the appraisal and decision making process.** This is really, really important, and it should be worked at. It may take some convincing others, because you may previously have trained them very well into doing your work for you; but if you really have done your homework then you should easily be able to convince them that you should do the talking.

The informal process

It is clear that there is a formal and an informal communication and persuasion process to follow. The informal process is the most important of these. You might consider the following:

1. Make a list of all of those who might be directly or indirectly affected by the proposal.
2. Note down how the proposal might affect them (positively and negatively), and/or how they might feel about it, and why.
3. Consider how to stress the positive impacts, and how any negative impacts might be reduced or eliminated.
4. Arrange to meet to discuss the idea, at a fairly early stage (in some cases, right at the outset), and prepare carefully for the meeting.
5. Identify all others who are not directly affected but who should be well briefed in order to win their approval. Arrange to meet them, and be very well prepared. Try to meet first with those who (a) are reasonably likely to approve, and (b) are influential within the decision making system.
6. You may meet with objections or resistance. There are said to be four main kinds of objections:
   - Misconceptions
   - Scepticism
   - Real drawbacks
   - Genuine complaints

   In dealing with objections, there are two key principles:
   - Persuade through involvement (talking is involvement…);
   - Earn the right to get agreement.

   Here are some steps to follow in responding to objections or resistance - this is "dealing with objections, by numbers", but it does work:
   - Encourage: Make it clear that you're ready to listen to the objection, without getting argumentative over it. And listen very attentively to what the person is saying.
   - Explore: Never assume that you somehow 'know' the objection, or even that the stated objection is the actual or most important one.
   - Test: test out your understanding, and perhaps test options that might meet the objection.
   - Respond: Be as specific as possible. Be clear and succinct. Try to speak in language that will put the other at her/his ease. Depending on the objection:
     - If *misconception*….. clarify and explain
     - If *scepticism*… prove through examples, references, and other solid evidence, that the proposal is sound
     - If a *real drawback*… show how the advantages outweigh the disadvantages; try to broaden the issue out to the "bigger picture", if this is advantageous
     - If a *genuine complaint*… show your responsiveness with a plan to modify the proposal.
7. Try to meet with everyone who may be involved in the decision making process. It may be that you pick up some trade-offs that would be good for everybody, along the way.

The formal process

1. Again, the real aim here should be to have an involvement, as far through the process as possible.
2. If/when you cannot be directly involved, then you should do whatever you possibly can to make sure that the person who will present the proposal is fully briefed - both on the virtues of the proposal and on any possible objections. Try to provide information on who is likely to be in favour of the proposal, and who against - and why.
3. If a presentation is to be made, it should be prepared very carefully indeed. The meeting should be established such that there is an adequate amount of time to discuss it - try to avoid having it as the last item on the agenda, or the item before lunch! Ensure that the problem, the options, the recommendation, and the results/impacts are *stated in terms of benefits to which the meeting will respond.*
4. Avoid over-complex technical detail, and avoid jargon at all costs.
5. Keep it short; keep it succinct; keep to the time available, treating it as a maximum rather than as an allowance; know when to stop.
6. When preparing a presentation, take time to practice the beginning so that it is punchy and to the point. Take time also to practice the end, making certain that what you say at the end is listened to, and is what you wanted to say.
7. Try to ensure that you provide succinct evidence that shows how other, previous/ similar projects saved energy and costs (but be sure that you are on reasonably safe ground in claiming any such benefits).
8. Make sure you are crystal-clear about what you are requesting. Make sure you are crystal-clear about what the *decision* is.
9. If there are major objections, *and* if you feel committed to the project, try to spot as early as possible when it will go against you, and try to get agreement that rather than say "no" straightaway, you could do some more work and if warranted report back.

After Approval

If projects are approved, it is vitally important that they be started without delay. In industry, an enormous number of projects are approved but never actioned - thus losing out on all of the effort of having made the proposal in the first place. It also ensures that the proposer loses out, in terms of reputation for getting things done. And it may be a sign of a badly analysed proposal, where the real costs and difficulties of implementation hadn't been properly thought through.

It's equally important that completed projects be followed up, and reported upon to those senior managers who were involved in its approval. Success and failure should be reported - though everyone will be excused for reporting failures a little less frequently than successes.

If possible, get publicity for the project. This can be in the plant newsletter; in corporate publicity; in an industry newsletter or the newsletter of a scheme such as SEI's Large Industry Energy Network.

In the following final chapter, we will look briefly at the follow-through process, and at the possibilities for using one success to breed others.

Annex to Chapter 6

Summary of Example Proposal

Various short worked examples of calculations have been provided in places throughout the text of this Guide. These examples have in the main been provided by member companies in SEI's Large Industry Energy Network.

In this Annex, a further example of a full proposal is provided. This is presented in summary form, as there would not be sufficient space to provide all of the documentation, or indeed of the full text of the proposal itself. This example, too, was provided by member companies of the Large Industry Energy Network. It should provide a concise illustration of the points made in the Guide - specifically, the ideas presented in this chapter, and in Chapter Four.

It is not claimed that this represents a complete or even a specimen example of a good investment proposal. It is included here mainly to illustrate and exemplify some of the points discussed in the Guide, and to provide an illustration of an actual successful proposal made by an energy managers in a typical Irish organisation.

Example: Installation of Additional CHP Unit

Some details have been changed in order to disguise the company which provided the case example. Also, some details have been added or deleted, and the structure of the proposal has been altered to match the structure suggested in this Guide. However, we must emphasise that this is only one of many possible structures - and of course we have pointed out that each company usually has its own guidelines and procedures to be followed.

Summary

Background

A CHP installation is essentially a small packaged electricity generation station, which uses a gas turbine engine similar to an aircraft engine as the prime mover. This is operated on natural gas. The advantage of CHP is that the waste heat generated in the production of electricity can be harnessed and used as a source of thermal energy on the site. Also, any spare electricity may be sold back to the national grid, thus generating an income. Because of the use of both electricity and heat, CHP units operate at efficiencies of 80% or so, compared with less than 40% for electricity purchased through the national grid.

Our first CHP (Combined Heat and Power) unit was installed in 1996. Since its installation, we have:

- *Saved an average of €100,000 per annum on energy costs;*
- *Reduced flue emissions of CO_2, NOx and other harmful emissions from other sources, by 7,225 tonnes (over five years).*

Last year, we installed a second unit as part of the electrical and heating infrastructure upgrade, which will provide 1 MW of electrical power, and 1.2 MW of heat. When fully commissioned, it will serve as an electrical standby generator. Expected results from this unit include:

- *Savings of €150,000 on energy costs, in the first full year of operation;*
- *Reductions of 2,182 tonnes per annum of noxious emissions.*

Our experience of CHP so far is very good, and the units installed have performed some 10% above expectations, both in financial and environmental terms.

Due to the expansion programme now approved and about to proceed, we face a considerable expansion of our electrical and heating needs. This provides the opportunity to expand further our use of CHP.

Options

Since CHP options have been fully explored in previous feasibility studies and investment proposals, we do not present alternative options here.

The option that was discussed and received general approval at the previous management meeting involved the purchase and installation of a third CHP unit, with a capacity of 2.7 MW electricity and 3.2 MW thermal power. This will meet the additional electrical and thermal requirements of our facility that have already been experienced, and will reduce our dependence on electricity from the national grid by the amount stated above. It will also provide an additional 2.7 MW of standby electricity to the facility, should this be required.

Capital costs

Based on quotations received from four major suppliers (including the suppliers of our previous two units), the capital costs are estimated as follows:

CHP Package (Incl all ancillary equipment)	€750,000
Electrical installation work	€110,000
Mechanical installation work	€150,000
Civil works, cranage, and attenuation	€100,000
Miscellaneous	€40,000
	€1,150,000

It is anticipated that all of the above costs will be incurred over a six month period during the coming financial year.

Costs and Savings

Estimated annual running costs, to cover the CHP management contract, will average €50,000 per annum (today's prices).

The above costs will not be incurred until the first year of operation, since the first year will be covered through the installation contract.

We do not anticipate any extraordinary costs arising, over an above that mentioned above - since the management contract will deal with all supplies needed. The savings do not include the quite considerable maintenance costs associated with the existing heat generation for space heating.

Average net estimated savings, arising from savings on both electricity and natural gas (there will be a considerable saving on gas purchased currently for space heating), will be €320,000 per annum (today's prices).

Approximately €185,000 worth of net savings will be generated in the same year as installation.

Financial appraisal

The project was assessed on the basis of the following, which are the current company criteria for assessment of major capital investments:

- *Cost of capital after tax: 12.00%*
- *Useful life of equipment: 15 years*
- *Residual value of equipment after 15 years: zero*
- *Assessment to include inflation at average 2.5% pa over 15 years*
- *Corporation tax to be included[1] based on current long term rolling corporate plan.*

The results of the appraisal are as follows:

Simple payback period: 4 years 6 months

NPVr = 0.12 (after 15 years): €982,409

Internal Rate of Return: 28.81%

Note: Detailed cash flow figures plus NPV calculation are shown in the table on the following page.

Financial assessment of discounted cash flow/NPV

YEAR	EXPENDITURE			ESTIM. SAVINGS YEARS)	NET CASH FLOW	PV R = 12%	NPV (AFTER 15
	INITIAL INVESTMENT	ANNUAL COSTS	CORPOR'N TAX				
0	(1,150,000)			186,667	(963,333)	(963,333)	
1		(29,896)	(3,400)	328,000	294,704	263,129	
2		(52,531)	(25,121)	336,200	258,548	206,113	
3		(53,845)	(17,787)	344,605	272,973	194,297	
4		(55,191)	(14,783)	353,220	283,246	180,008	
5		(56,570)	(15,691)	362,051	289,789	164,434	
6		(57,985)	(16,623)	371,102	296,494	150,213	
7		(59,434)	(24,765)	380,379	296,180	133,977	
8		(60,920)	(40,118)	389,889	288,851	116,662	
9		(62,443)	(41,121)	399,636	296,072	106,767	
10		(64,004)	(42,149)	409,627	303,474	97,710	
11		(65,604)	(43,203)	419,868	311,060	89,422	
12		(67,244)	(44,283)	430,364	318,837	81,838	
13		(68,926)	(45,390)	441,124	326,808	74,896	
14		(70,649)	(46,525)	452,152	334,978	68,543	
15		(30,173)	(47,688)	193,106	115,246	21,055	
16			(20,367)		(20,367)	(3,322)	982,409
Totals	**(1,150,000)**	**5,797,990**	**(855,415)**	**(489,014)**	**3,303,561**	**982,409**	

Uncertainties and sensitivities

Given our prior experience with CHP, and the proven reliability of the technology, we do not believe that there are significant risks associated with the proposal.

In terms of sensitivities, the greatest sensitivity is in regard to the price of electricity and natural gas. We consider that our long term agreements provide us with adequate cover. Fluctuations in electricity prices are more or less pegged to natural gas prices for our company; so that movements in costs and savings are linked. Analysis shows that a reduction after five years in electricity prices of 10% more than that for natural gas, would reduce NPV by 8%, to €904,000 (IRR = 26.3%). This still makes the proposal very attractive from a financial viewpoint.

1 Note to readers of this Guide: The Corporation Tax computation is complex both in its timing and its amounts; and in some years it depends on the projected profit situation of the company in the year in question. The Corporation Tax data is provided by the Financial Department.

Other considerations

1. The unit will require space comparable to that taken up by CHP unit number 2 (the additional capacity of the new unit will not require greater space). Provision for this was made in installing the second unit, so that a site is already available.
2. Since installation, commissioning and maintenance will be covered by the installation and management contracts, no additional workload is anticipated for the company workforce. Management of the unit will be well within the capacity of existing technical management, and this will be undertaken by the Facilities Department (Energy Manager) - as with the first two units.
3. The unit will provide an additional 2.7 MW additional standby capacity which, together with the standby capacity available from the existing CHP on site, will provide 110% of the standby capacity specified currently in our contingency plans for the site.
4. Further development of CHP in this company will be in line with national policy in relation to promotion of CHP.
5. The unit will contribute to national objectives aimed at reducing greenhouse gas emissions, and will contribute to a national saving of almost 2,000 tonnes of CO_2 equivalent per year.

Proposed means of tracking performance

Full metering will be installed (as with the second CHP unit) which will permit precise measurement of electrical and thermal energy supplied by the unit, along with precise identification of natural gas consumption. Electricity and gas savings will be computed automatically by the M&T system to which the unit will be coupled, on the basis of the data read on a constant basis from the CHP installation.

The performance of the installation, both in terms of costs and savings, will be included in our standard monthly energy reports.

A full assessment of performance will be undertaken six months and two years following commissioning.

Request

Approval is now sought for:

1. The expenditure of €1,150,000, to commence within three months of approval, and to be completed within nine months of commencement.
2. Invitation of formal tenders for supply, installation and ongoing management of the new CHP unit.
3. Initiation of preliminary site works, within one month of approval.
4. Authorisation to proceed with all aspects of this project, subject to the establishment of the usual control procedures.

Signed: _____ (ENERGY MANAGER)

Date: _____

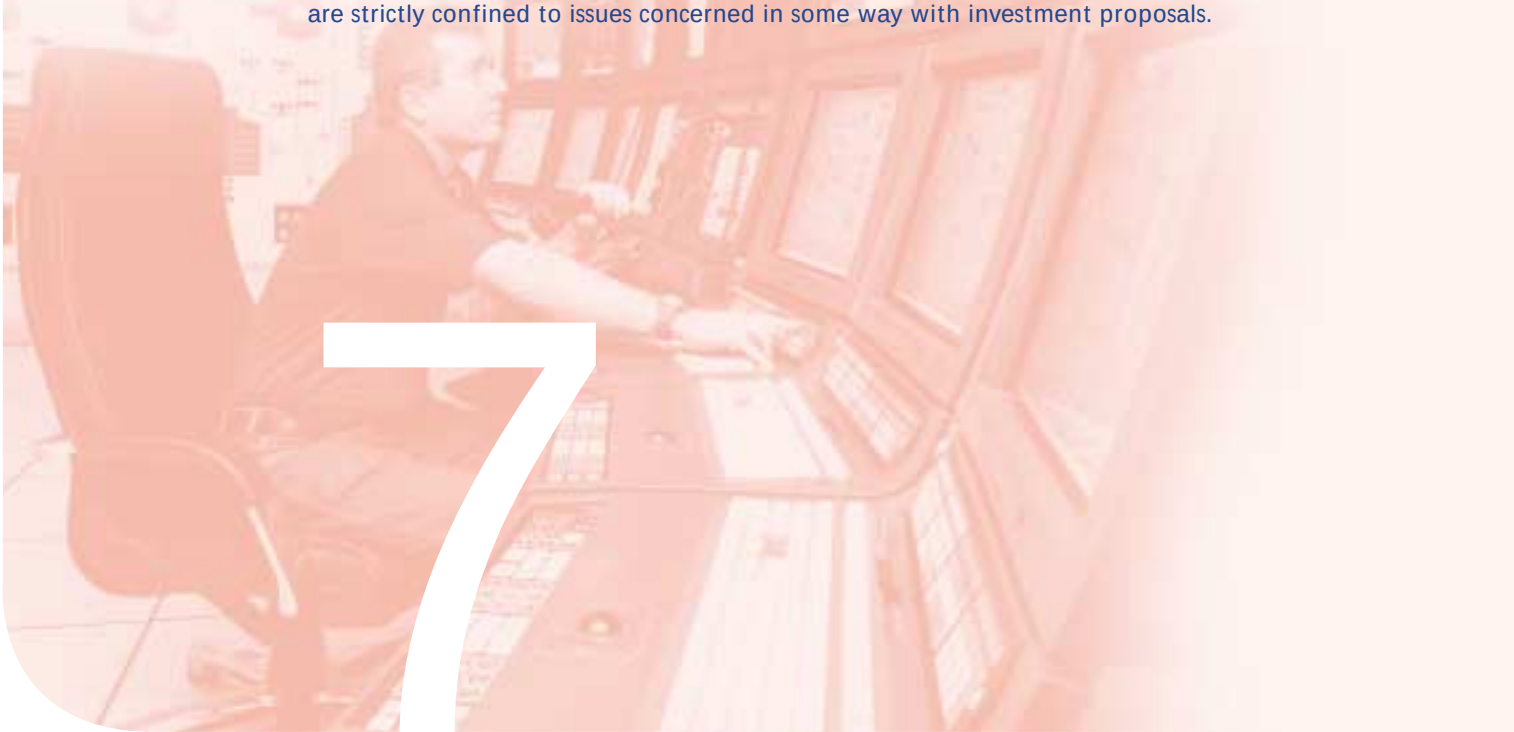
Preliminary approval by: _____ (SITE GENERAL MANAGER)

CHAPTER 7

Follow Through

As we mentioned in the closing section of Chapter Six, many approved projects ultimately fail either because they are not started sufficiently early, or because they aren't started at all. This may seem surprising, given the amount of work required to get a proposal approved. But it is one thing to win approval for something, and quite another to find the time and resources to make it happen afterwards. The problem with any delay is that organisations, seeing the work not starting, will find themselves under pressure for money to be used on other activities; if your project isn't started, then you can't blame others for questioning whether it really is as urgent and important as you had claimed.

In this final chapter, we look briefly at a few aspects of implementation that may have a bearing on your ability to win further investment proposals in the future. Of course, this is not intended to be a chapter on project planning and management; any comments are strictly confined to issues concerned in some way with investment proposals.



7

Getting started early

1. In your preparations for appraisal of the proposal, you will presumably have entered into discussions with suppliers and installers - or, at the very least, you will have discovered who the suppliers are, the availability of the equipment and ancillary plant and parts, and the kinds of lead times involved. With regard to a project which you believe has some urgency, and which has a reasonable chance of proceeding, it is a good idea to go as far as possible in discussions with suppliers and installers - as far along the path of obtaining quotes and tenders as is reasonably feasible. Serious contact with suppliers - contact that explores all of the pros and cons, the possible delays and hold-ups, and the *real* lead times that will apply *at the time at which you expect to be able to proceed* - will help enormously in your being able to get started quickly, and to have anticipated any likely delays.
2. Also, as part of your preparation work - and especially as part of your process of influencing the management team in favour of the project - you should have held detailed discussions with all those who (a) will be affected by the project, and (b) will be required to help in the installation and commissioning. Any likely difficulties or reasons for delays will have been explored and addressed. In fact, as the proposal proceeds, and as the chances of acceptance increase, you should plan to start work on developing plans with the other managers involved for the implementation of the project. Your aim should be to have plans in place *by the time of the approval* that will enable you to put the implementation process into action just as soon as you receive clearance. That requires considerable advance planning, but it is planning that you will have to do anyway - you may as well tackle it early rather than leave it till it is too late.
3. There is also the issue of planning your *own* time and resources. It is one thing to plan for others' co-operation; it is quite another to ensure that you yourself have the time and space to devote to this project. You have to work on the basis that it will be more time-consuming than you had anticipated - particularly at the initial and start-up phases, and at the completion/commissioning stages. This project is *your* baby, and you have to nurse it along. The alternative, of course, is to make sure that you have adequate resources in place to carry out this work for you. However, you should always make sure that you keep close contact with any project for which you have worked in winning approval and funding.

Tracking and reporting results

1. Again, this was mentioned at the close of the previous chapter, but it should be mentioned again. One of the most common problems found with major energy projects is the failure to establish the means of monitoring the results. This is very often a particular problem with energy projects, of course: with other projects, such as the development and introduction of a new product, or the improvement of quality, or the establishment of a new payroll system, it is generally easy enough to measure the principal results, such as increased revenue, market share, customer perceptions, reductions in rejects or customer complaints, and so on. With energy, although the results should be relatively easy to monitor, they often are not, simply because of the totally inadequate means that are usually available for tracking energy consumption. Furthermore, changes in energy consumption are very often masked by other changes, so that you often find yourself able to say something like "Well, we believe that energy costs have gone down, and they would have gone down much more, but the changes to products A and B, and the bad winter weather, have had negative impacts on energy consumption generally". The other problem is that many managers find themselves able to track energy consumption associated with the project, after implementation, but find they have nothing to compare it with from before the project. Wherever possible, you should make sure you have done whatever is necessary to be able to address the following:

    a. Prior to the beginning of the project, you should have reliable records, over a reasonable period, of historical energy performance (usage and cost) associated with the area that will be affected by the proposed project. Indeed, such a record *should* be a part of the data gathering you have carried out in preparing the proposal.

    b. Such records of energy performance should include useable records of other data that might affect energy performance. For example, if energy consumption is closely associated with product throughput, or with water consumption, or effluent throughput, or degree-days, then you should have data on these also, and be able to explain a large part of the variation in energy consumption on the basis of those variables. That is the key: to be able to explain variation in energy performance in such a way that it convinces you and others.

    c. Make sure that your project plan, and the money sought, includes whatever is needed to permit ongoing tracking of energy performance - and those variables that affect energy consumption - in an accurate and easy-to-gather way. What is vital is that you should be able to compare the before and after situations, so that you can reliably estimate any energy savings or other benefits resulting from the project.

    d. Make sure you have resources and arrangements in place that will make sure that that performance data is actually collected and recorded, on a regular and ongoing basis - at least for a sufficient period to enable full assessment of the results.

2. Whether invited to do so or not, and whether the results are positive or negative, you should make sure that you allocate time and resources to analyse the impacts of the project, in terms of cost/energy usage, and in other quantitative and non-quantitative terms. Any such analysis should be compared with claims that were made in the original proposal, and any variations should be honestly explained. This may seem like creating a rod for your own back - but if the project hasn't yielded the expected results, you may as well be the first person to know this, rather than having the post-mortem being ordered and managed by someone else. And of course if the results match or exceed those you claimed in the proposal, then you really have something to tell people about! The aim here is not (well, not just) to blow your own trumpet; rather, the aim should be to build confidence in the company that energy projects can and do meet the claims that are made for them. It will also build confidence in you as a manager, of course, which is pleasing.

3. Again whether invited to or not, you should make it a practice to produce regular progress reports on all investment projects, focusing in particular on:
   - Progress in installation and commissioning;
   - Problems encountered, and how resolved;
   - Progress of expenditure versus approved funding - in particular, any cost overruns that may be anticipated;
   - Performance of the project, when completed, in terms of energy usage/cost, other savings/costs, and non-quantifiable impacts.

These should be reported, in summary form, to senior management, as a routine and regular activity. If there is good and/or interesting news - and especially if it is possible to acknowledge the input of others - you should try to get other publicity for the project, whether in newsletters or circulars or company reports.

Creating a 'Virtual' Capital Return Budget

Obtaining funding is always problematic. One device you should consider is the establishment of a simple system that will keep track of the expenditures and resulting savings that have arisen each year from your capital expenditure projects in the energy field. If you have been establishing the monitoring mechanisms for each project as recommended in the section above, then keeping overall track is simplicity itself. All you need to do is to maintain a spreadsheet that assembles all of the expenditure and savings data from all of your projects into one table - producing an overall/running tally of expenditure and savings.

Figure 7.1: Example of a Capital Return Budget

	99/00 ACTUAL	00/01 ACTUAL	01/902ACTUAL	02/03 ACTUAL	03/04ESTIMATED
Expenditure					
Energy audit recommendations implemented					
No cost (€)	0	0	0	0	0
Low cost (€)	1,500	1,500	1,000	500	1,500
Replacement of insulation (€)	7,500	2,500			
Steam trap replacement (€)		10,500			
Heat recovery project (€)		15,700	9,000	2,500	
M&T initial phase (€)			10,000	3,000	3,000
M&T automation (€)				15,000	3,000
Extra metering in packaging area (€)				13,000	2,000
Savings					
No cost audit items (€)	0	0	0	0	0
Low cost audit items (€)	5,000	6,500	7,200	3,400	7,500
Replacement of insulation (€)	5,000	5,300	5,600	2,700	5,200
Steam trap replacement (€)		4,500	5,750	5,750	5,750
Heat recovery project (€)		4,000	13,500	16,500	18,500
M&T initial phase (€)			2,000	18,000	14,000
M&T automation (€)				10,000	22,000
Extra metering in packaging area (€)				9,500	11,500
Total expenditure (€)	**9,000**	**30,200**	**20,000**	**34,000**	**9,500**
Total savings (€)	**10,000**	**20,300**	**34,050**	**65,850**	**84,450**
Savings - Expenditure (€)	**1,000**	**-9,900**	**14,050**	**31,850**	**74,950**
Savings - Expenditure (Cumulative) (€)	**1,000**	**-8,900**	**5,150**	**37,000**	**111,950**

Note that savings from No-cost items have not been included. They could be included, but it is better not to, since here we are keeping track of savings arising from *investment*. Of course, as energy manager you should also maintain a sheet which includes *all* energy saving projects and actions, and their ongoing results. This not alone helps you in keeping a tally of overall savings, but it also helps you to focus on ensuring that gains made by an action in one year are maintained in subsequent years.

The Capital Return Budget is especially useful for demonstrating that savings from energy projects usually result in ongoing savings - savings that continue well after the simple payback period (or the time horizon for a discounted assessment appraisal such as NPV) has been reached. So the cumulative savings can be considerably more over time than either the initial proposal indicates, or than anyone expects.

The Capital Return Budget also usually demonstrates that the biggest savings come from capital investment.

Furthermore, because you normally will have implemented short payback actions as the earliest changes, the table will usually show positive returns from the very beginning. This surplus may continue, as the savings from low-cost items continue to be enjoyed, even through a period of quite heavy and long-payback investment.

Finally, you can argue that your actions have already resulted in a "virtual" capital fund, from which you could draw for further projects. In general, don't play this card too strenuously. Like governments, businesses often don't like being told that savings must be spent in any one area: senior management prefers to retain the freedom to spread it around, and to take whatever decisions seem right at the time. Nonetheless, if you can demonstrate that energy investments do pay off, in the short and long runs, then it really does strengthen your hand in trying to get further proposals accepted.

A Closing Word

Remember that, in investment proposals as in everything else, you are trying to make a convincing case that will get you the decision you want. However, ultimately what will decide the outcome will be the faith that senior management has in your judgement and your ability to do your homework.

This takes time to build. It may be that you have to battle with a history of fairly poor proposals having been made in the past, or of accepted proposals not having been acted upon, or of returns not living up to the promise. That is why you have to ensure that each proposal you make is just as good as you can humanly make it. It has to be well researched, well assessed, well presented, and well followed up. It mustn't make promises that won't be delivered - promising a marvellous return just in order to increase the chances of acceptance is a very dangerous short term tactic that may return to haunt you. In particular, be prepared to take a long time to prepare for and submit your first professional proposal. If you are under a lot of time pressure, then either try to defer the proposal, or obtain resources to help you, or defer some other activities to allow you to concentrate on the proposal.

But above all, we have tried to convince you that it should be you who does the main work of financial assessment, setting out the case, creating a favourable climate for the proposal, presenting the proposal itself, and following through. Where you can't be directly involved, then you should ensure that the resources are there to do the work, and you should supervise it personally. Don't just leave it up to the boss, or to the finance department - try to do as much as you can yourself. This is not to say you shouldn't ask advice - of course you should, and it would be silly (and the loss of an opportunity to influence others) not to do so. You will have to obtain much data from the finance people, but this does not mean that you shouldn't try out the financial assessments yourself. At the very least, you must make sure that you understand and have thought about every aspect of the assessment, and of the case being made. Your reputation depends on it.

You won't win them all. But it would be nice to win some of them. And if you make the number you do win increase each year, then you are really succeeding. We hope this Guide will have helped you to improve your scoring record.

Annex to Chapter 7

Discount Tables (Present Value)

Discount Rate

YEARS:	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.893	0.877	0.870
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.797	0.769	0.756
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.712	0.675	0.658
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.636	0.592	0.572
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.567	0.519	0.497
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.507	0.456	0.432
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.452	0.400	0.376
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.404	0.351	0.327
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.361	0.308	0.284
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.322	0.270	0.247
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.287	0.237	0.215
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.257	0.208	0.187
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.229	0.182	0.163
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.205	0.160	0.141
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.183	0.140	0.123
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.163	0.123	0.107
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.146	0.108	0.093
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.130	0.095	0.081
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.116	0.083	0.070
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.104	0.073	0.061
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.059	0.038	0.030
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.033	0.020	0.015

Discount Rate

YEARS	16%	18%	20%	22%	24%	25%	26%	28%	30%	32%	34%	35%	36%
1	0.862	0.847	0.833	0.820	0.806	0.800	0.794	0.781	0.769	0.758	0.746	0.741	0.735
2	0.743	0.718	0.694	0.672	0.650	0.640	0.630	0.610	0.592	0.574	0.557	0.549	0.541
3	0.641	0.609	0.579	0.551	0.524	0.512	0.500	0.477	0.455	0.435	0.416	0.406	0.398
4	0.552	0.516	0.482	0.451	0.423	0.410	0.397	0.373	0.350	0.329	0.310	0.301	0.292
5	0.476	0.437	0.402	0.370	0.341	0.328	0.315	0.291	0.269	0.250	0.231	0.223	0.215
6	0.410	0.370	0.335	0.303	0.275	0.262	0.250	0.227	0.207	0.189	0.173	0.165	0.158
7	0.354	0.314	0.279	0.249	0.222	0.210	0.198	0.178	0.159	0.143	0.129	0.122	0.116
8	0.305	0.266	0.233	0.204	0.179	0.168	0.157	0.139	0.123	0.108	0.096	0.091	0.085
9	0.263	0.225	0.194	0.167	0.144	0.134	0.125	0.108	0.094	0.082	0.072	0.067	0.063
10	0.227	0.191	0.162	0.137	0.116	0.107	0.099	0.085	0.073	0.062	0.054	0.050	0.046
11	0.195	0.162	0.135	0.112	0.094	0.086	0.079	0.066	0.056	0.047	0.040	0.037	0.034
12	0.168	0.137	0.112	0.092	0.076	0.069	0.062	0.052	0.043	0.036	0.030	0.027	0.025
13	0.145	0.116	0.093	0.075	0.061	0.055	0.050	0.040	0.033	0.027	0.022	0.020	0.018
14	0.125	0.099	0.078	0.062	0.049	0.044	0.039	0.032	0.025	0.021	0.017	0.015	0.014
15	0.108	0.084	0.065	0.051	0.040	0.035	0.031	0.025	0.020	0.016	0.012	0.011	0.010
16	0.093	0.071	0.054	0.042	0.032	0.028	0.025	0.019	0.015	0.012	0.009	0.008	0.007
17	0.080	0.060	0.045	0.034	0.026	0.023	0.020	0.015	0.012	0.009	0.007	0.006	0.005
18	0.069	0.051	0.038	0.028	0.021	0.018	0.016	0.012	0.009	0.007	0.005	0.005	0.004
19	0.060	0.043	0.031	0.023	0.017	0.014	0.012	0.009	0.007	0.005	0.004	0.003	0.003
20	0.051	0.037	0.026	0.019	0.014	0.012	0.010	0.007	0.005	0.004	0.003	0.002	0.002
25	0.024	0.016	0.010	0.007	0.005	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.000
30	0.012	0.007	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Discount Rate

YEARS:	38%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
1	0.725	0.714	0.690	0.667	0.645	0.625	0.606	0.588	0.571	0.556	0.541	0.526	0.513
2	0.525	0.510	0.476	0.444	0.416	0.391	0.367	0.346	0.327	0.309	0.292	0.277	0.263
3	0.381	0.364	0.328	0.296	0.269	0.244	0.223	0.204	0.187	0.171	0.158	0.146	0.135
4	0.276	0.260	0.226	0.198	0.173	0.153	0.135	0.120	0.107	0.095	0.085	0.077	0.069
5	0.200	0.186	0.156	0.132	0.112	0.095	0.082	0.070	0.061	0.053	0.046	0.040	0.035
6	0.145	0.133	0.108	0.088	0.072	0.060	0.050	0.041	0.035	0.029	0.025	0.021	0.018
7	0.105	0.095	0.074	0.059	0.047	0.037	0.030	0.024	0.020	0.016	0.013	0.011	0.009
8	0.076	0.068	0.051	0.039	0.030	0.023	0.018	0.014	0.011	0.009	0.007	0.006	0.005
9	0.055	0.048	0.035	0.026	0.019	0.015	0.011	0.008	0.006	0.005	0.004	0.003	0.002
10	0.040	0.035	0.024	0.017	0.012	0.009	0.007	0.005	0.004	0.003	0.002	0.002	0.001
11	0.029	0.025	0.017	0.012	0.008	0.006	0.004	0.003	0.002	0.002	0.001	0.001	0.001
12	0.021	0.018	0.012	0.008	0.005	0.004	0.002	0.002	0.001	0.001	0.001	0.000	0.000
13	0.015	0.013	0.008	0.005	0.003	0.002	0.001	0.001	0.001	0.000			
14	0.011	0.009	0.006	0.003	0.002	0.001	0.001	0.001	0.000				
15	0.008	0.006	0.004	0.002	0.001	0.001	0.001	0.000					
16	0.006	0.005	0.003	0.002	0.001	0.001	0.000						
17	0.004	0.003	0.002	0.001	0.001	0.000							
18	0.003	0.002	0.001	0.001	0.000								
19	0.002	0.002	0.001	0.000									
20	0.002	0.001	0.001	0.000									
25	0.000	0.000	0.000										
30	0.000												

Part 2

Training Modules

Training Designs for Successful Energy Investment Proposals

Contents

What is included?

The three modules in this training section are:

1. Overview Session - an introduction to investment proposal; a consideration of the factors for and against energy proposals, and a five-step framework for considering the work of preparing and presenting successful proposals.
2. Basic Financial Appraisal Techniques - an introduction to all of the basic financial appraisal approaches, including simple payback, rate of return, NPV and IRR. Data to be included in or excluded from cash flow models are discussed, and issues such as risk, discount rate, etc., are also touched upon. Participants work on current/real cases.
3. Presenting the Proposal - a detailed session that covers both the formal/written steps involved, but also discusses the informal and ongoing aspect of developing influence and trust within the organisation. Participants work on current/real cases. It is intended that there should be senior level inputs on organisational procedures and policies, and on current factors influencing investment decisions in the organisation.

MODULE 1 **Overview Session**
An overview on the making of energy investment proposals 84

MODULE 2 **Basic Financial Appraisal Techniques**
This session covers the basics of financial appraisal 88

MODULE 3 **Presenting the Proposal**
Covers the whole issue of presenting the energy investment proposal 92

MODULE ONE

Overview Session

This overview training session on making energy investment proposals is intended to provide a group of technical staff/managers with an opportunity to spend some time considering the ways in which investment proposals are presented in their organisations. More specifically, it is intended to have them consider the factors that work for and against proposals for energy-saving investments, and to think through how they might improve their chances of success.

The session is based upon Chapters One and Two of the accompanying Guide to Energy Investment Proposals, and much of the content is drawn from those chapters. These chapters should be to hand and referred to, in designing and working through this training module.

This session could be run as a stand-alone training event of approximately one half day, or it could represent the introductory module(s) of a longer training course that also covered specific aspects of investment proposals in greater depth.

1

This training guide includes:

- ***Key learning objectives***
- ***Summary of equipment required***
- ***Outline layout of session***
- ***Suggested slides (may be modified as necessary), in accompanying Powerpoint file***

Objectives

By the end of this session, participants will:

- Have identified the factors which work for and against energy investment proposals being accepted or rejected, both generally and in their own organisations;
- Have explored ways in which they might reduce the negative factors and utilise the positive;
- Be able to explain a five-step framework for making investment proposals, and be able to provide a couple of key 'Dos' or 'Don'ts' for each of the five steps.

Requirements

The following equipment is required:

- One training room plus an additional break-out room for group-work - alternatively, a main training room of sufficient size to permit two or three groups to engage in discussion sessions.
- One flip-chart per group.
- Overhead projector.
- Chapters One and Two of the Guide could be used as handouts for the session.

Layout of Module 1

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
Introductions (15 min)	Trainer self-introduces, and explains rationale for the training. Self-introductions by participants, including a half-minute each on their prior experience and involvement with making investment proposals.	Depends on situation. For an in-house training session, manager from company should also participate in the introduction	1 (Title slide)
Introduction to session content (5 min)	Trainer describes briefly what the session will cover	Could also mention use of group work, and plenary activity. Could also say particularly interested in company-specific issues (which probably won't be adequately covered in the notes	2
Plenary exercise: factors for and against success in making energy investment proposals (30 min – 15 min for each question)	Trainer leads group (in plenary session) in an informal "brainstorming" session on two questions, taken in series: "What can lead to failure, with energy investment proposals?" "What is it about some proposals that are successful?"	Trainer notes responses from individuals onto flip-charts (using one chart for responses to first question, then other flip-chart for responses to second question). In dealing with the first of these questions, it might be worth asking first about all investment proposals, and then about *energy* proposals in particular. In dealing with the second question, it might be worth asking the question about "in all companies", and then about "in this company, in particular - anything special or different?" Judgement will need to be exercised as to whether a manager from the company should be present for this.	3/4
Trainer summary – plenary brainstorm (10 min)	Trainer summarises the key points emerging from the ideas provided by the participants to the two questions, drawing attention to ones that seem particularly interesting.	Watch for responses that seem peculiar to this company, and be prepared to probe a little.	
Group task on how to improve chances for proposals (30 min)	Divide into two groups (or more if necessary). Groups are asked to address the question on slide 5: "Bearing in mind the things that have been written up on the flip-chart just now, what specific things could you do, in order to: • *Utilise the positive factors?* • *Reduce the impact of the negative factors?"*	Trainer should set this up by asking the group to imagine that they, as a group, are aiming to make an energy-related investment proposal, that means quite a lot to them – they *want* it to succeed. Trainer should ensure that each group appoints a spokesperson. Equip each group with flip-chart and pens (or slides, but flips would be better)	5
Coffee Break (20 min)		Could let the groups run the group work into the coffee break if needed in order to finish up and have a decent presentation prepared - insist on a good written presentation of the ideas in summary.	

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
Groups report back (30 min: 10 min per group, plus 10 min summary/ discussion)	Each group's spokesperson presents the group's main ideas, using flip-chart as an aid. Others are encouraged to ask questions and contribute comments.	Trainer should note down points of special importance or novelty. Important that trainer should give a short but effective summary at end. Don't hesitate to provide "expert" view, in addition - or to add points - but don't foreshadow input to come!	
Input: Framework for successful proposals (20 min)	Trainer provides input on the five-step framework contained in Chapter Two (pp13ff) of Guide.	Stress all the way through that making a successful proposal is about *far* more than just a written proposal. In fact, success depends ultimately on how you approach and do your job, in an ongoing way, and not just on the proposal itself. Input should be just enough to explain what each step means. Content should be based on pages 12-17 of Guide.	6 - 11
Small group work - in threes - where sitting in main room (20 min)	Participants are asked to work together in groups of three, where they are sitting. On the basis of the input just made: what do they think are the four or five *very most important* things to focus on in this company, in order to be successful, and what *specific* things should you do (e.g., who are the important people to influence? what particular data should be checked upon? what about the informal process?	Trainer might put task up on flip-chart, or simply give it verbally - but make sure it is understood. Make sure each "triad" has someone to report back - informally and from where the group are sitting.	
Summarise session (10 min)	Trainer pulls session together, summarising key points, and emphasising any specific points that apply to *this* organisation/		

Notes:

- *This session should take approximately one half day, and it should serve to introduce the scope, and some of the issues, in developing and presenting investment proposals.*
- *In order to give it greater depth and specificity, a further session could be added in the afternoon, with an input from a manager from the company:*

  1.Talking through the proposal process/procedures/criteria in this organisation;

  2.Highlighting some specific considerations facing the company, in relation to investment proposals;

  3.Presenting some company-specific examples, provided these are of sufficient quality to serve as a model for what should be done.
- *The above would make for a very full whole day of training. It could be stand-alone, or it could be part of a longer training programme, in which other specific sessions are added, and in which participants work through their own proposals from start to finish.*
- *If the above is to be part of a longer, modular training programme, then a general input on financial appraisal methods should probably be added as a module prior to the company-specific input on processes/procedures*

MODULE TWO

Basic Financial Appraisal Techniques

This session covers the basics of financial appraisal, including discounted cash flow analysis. It is not intended to provide full coverage of the topic, and many issues are omitted. The session is intended for technical staff who have had no previous training in discounted appraisal methods.

This session could be run as a stand-alone training event of approximately one half day, or it could represent the introductory finance module(s) of a longer training course that also covered specific aspects of investment proposals in greater depth.

Ideally, the session would be run with the group applying the techniques learnt to a real example from their own organisation. This could be a proposal recently approved, or it could be an idea or ideas that the group had agreed to work on, and on which they had already gathered data.

This training guide includes:

- ***Key learning objectives***
- ***Summary of equipment required***
- ***Outline layout of session***
- ***Suggested slides (may be modified as necessary), in accompanying Powerpoint file***

Objectives

By the end of this session, participants will:

- Be able to describe simple appraisal techniques such as payback and return, and in particular to appreciate their drawbacks and limitations.
- Be able to develop a simple cash flow model, and describe the items that should and should not be included.
- Be able to apply discount factors to cash flows so as to produce the NPV of a proposal, and be able to explain the concept of NPV.
- Be able to find and explain the Internal Rate of Return on a project.
- Have applied the above to a company-specific project.

Requirements

The following equipment is required:

- One training room.
- Overhead projector.
- Chapters Three and Four of the Guide could be used as handouts for the session.
- Discount tables will also be needed. These may be photocopied from pages 80 and 81 of the Guide.

Layout of Module 2

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
Introduction (10 min)	Trainer introduces session, stressing that this isn't a difficult subject, but many people think it is. Session will cover: • *Cash flow* • *Ways of evaluating the financial attractiveness of an investment.*	The assumption here is that the participants have no knowledge of DCF, and that they may not have used many equations or algebraic symbols for some time.	1
Cash flow – input with discussion (30 min)	Trainer poses the question "What are legitimate costs or savings, in relation to an energy investment?" Produces two lists on two flip charts; lists suggestions from the group, and discusses as appropriate. makes sure of dealing with depreciation, corporation tax (and how handled in this organisation), inflation (and how handled in this organisation). Deals with Fixed and Variable costs, in discussing energy savings. Shows what a simple cash flow model would look like.	Point out that the start of any financial evaluation is to gather information. Information about many different things, including financial; we'll be dealing only with financial data, here. And the real start of any financial assessment has to be a decision about whether it produced money for the company - whether its savings outweighed its costs. Then pose the question "What are legitimate costs or savings, in relation to an energy investment?"	2, 3, 4
Quick intro to method from here on (5 min)	Trainer introduces simple example to be worked through during rest of session (replacement of lighting in office block): Verbally gives background, as in Guide - page 36. Presents costs and savings on slide. Shows cash flow model applied to example.	Point out that from here on we will be doing calculations; we will base all of these, and our subsequent discussion, on a simple example.	5, 6
Simple payback (10 min)	Trainer talks through following approach on pp33-34 of Guide, and using Cum Cash Flow to illustrate.		7, 8
Rate of return (5 min)	Trainer describes Accounting rate of return (RoI) - p34 of Guide		9
Time value of money, and discounting (10 min)	Trainer talks through the time value of money, and discounting, based on Guide pp35-36. Describes how to derive PV from tables.	Avoid the equation altogether if you can, and consider introducing it *after*, not before, introducing discount tables.	10, 11, 12
NPV (10 min) **Discounted payback** (Optional – not timed)	Trainer demonstrates by working through example - see Guide pages 36-40 Trainer illustrates that it takes 7.5 years to give a payback using discounted cash flows. Use flip chart to illustrate.	 Use to make the point that short simple paybacks are often demanded because even a short simple payback can mean quite a long discounted payback!	13, 14,15

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
IRR (10 mins)	Trainer demonstrates by working through example - see Guide pages 40-42, and follow discussion in sequence presented.	You already used r = 20%. This time, use r = 10%; these are sufficient to produce the IRR graph.	16, 17
Summary and review (10 minutes)	Trainer summarises results, again using examples from Guide (page 42), and further discussion from remainder of Chapter. Base discussion and review on the question posed on Slide 18		18
COFFEE (20 MINS)			
Case study application (100 min)	Options: • *Trainer or company representative works through a real case example with the participants - preferably by setting the scene and encouraging the group to carry out a financial appraisal, and report back, with plenary discussion after all report-backs.* • *Prior to this session, group has been briefed on data collection, and has selected and gathered data on one or more actual possible investments in the company. This data is worked through based on the previous session, with report-backs and discussion/comment.* • *The trainer could present a simple case for analysis by the participants in small groups - see pages 43-44.*		
Sensitivity and risk (Optional)	If time and interest, trainer talks through other items in Chapters Three and Four, not covered, such as Sensitivity and Risk.		
Summary (20 min)	Trainer summarises the key points of the half day.	Emphasise that the figures are easy - it is the data collection that is hard - and important! Stress the importance that the proposers themselves should do, and keep charge of, the financial data gathering and analysis/assessment.	

Notes:

- *This session should take (a long!) one half day, and it should serve to introduce the fundamentals of financial appraisal.*
- *In order to give it greater depth and specificity, the whole session could be lengthened, with an input on the company procedures in some detail, and detailed discussion of company issues and policy in relation to energy and investment. This would lengthen the session to a full day.*
- *This session could be stand-alone, or it could be part of a longer training programme, in which other specific sessions are added, and in which participants work through their own proposals from start to finish.*
- *If the above is to be part of a longer, modular training programme, then the general introductory session in this package would probably be appropriate.*

MODULE THREE

Presenting the Proposal

This session covers the whole issue of presenting the energy investment proposal - both the formal and the informal aspects. The session is intended for technical staff who have had little or no experience in presenting proposals - but whose jobs will involve them in doing so in the near future.

This session could be run as a stand-alone training event of approximately one half day, or it could represent the third or fourth module in a longer programme.

Almost invariably, this session should be run with the group applying the techniques learnt to a real example from their own organisation. This could be a proposal recently approved, or it could be an idea or ideas that the group had agreed to work on, and on which they had already gathered data and performed analyses.

3

This training guide includes:

- ***Key learning objectives***
- ***Summary of equipment required***
- ***Outline layout of session***
- ***Suggested slides (may be modified as necessary), in accompanying Powerpoint file***

Objectives

By the end of this session, participants will:

- Be able to describe the procedures involved in presenting proposals within their own organisations.
- Be able to describe a 'standard' framework for presenting proposals, along with the company formats for doing so.
- Be able to describe some approaches for ensuring that the proposal receives maximum informal support.
- Have written a proposal, based on a supplied actual project being developed in the organisation.

Requirements

The following equipment is required:

- One training room.
- Overhead projector.
- Break-out rooms as needed to accommodate small-group working.
- Chapter Six of the Guide could be used as a main handout for the session. Chapters Five and Seven could be included also, if these are not being used elsewhere on the programme.

Layout of Module 3

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
Introduction (10 minutes)	Trainer introduces session, and summarises what will be covered: • *short input/discussion on 'shape' of written proposals - general and company-specific* • *short discussion of the more informal aspects* • *a large amount of the time will be spent on writing an actual proposal based on an organisation-specific proposal currently under consideration.*	Trainer can introduce the idea that there is a formal and an informal side to winning the proposal. Time could be given for this, if desired. The relative importance of formal and informal routes could be discussed, along with the rights and wrongs of informal means.	
Structure of the written proposal (30 minutes)	Trainer invites suggestions from the group as to what should be in an 'ideal' investment proposal. Logs these to a flip-chart, and discusses. Then works with the group to 'order' the suggestions into reasonable categories, and a 'chapter list' for a proposal. Presents the structure suggested in pages 64-65 of the Guide, filling in any necessary information, from pages 64-67. The trainer should talk through the key content issues in each section, listing key words on the flip as appropriate.	Participants should be asked to forget about what they may already know about what is in their own organisation'' procedures and forms. Trainer should be careful *not* to suggest that this 'standard' framework is any better than the listing the group came up with. The group's suggestions may be better!	
The organisational process (40 minutes)	A senior manager from the organisation should talk through the formal proposal process in the organisation, covering: • *written requirements* • *current evaluation criteria* • *the current procedures/processes*		
Current organisational issues in investing and making proposals (20 minutes)	Senior manager from organisation should discuss the various climate for investment, along with the current strategic factors, that would affect decisions about energy investments.		
COFFEE (20 MINS)			
The informal influence process (30 minutes)	Trainer invites suggestions from the group on: "What are the kinds of thing (legal!) you could/should do in the organisation, to improve the chances for your proposal?" Logs ideas to flip-charts, and discusses as it goes along. Uses ideas from pages 68-69 (include some items from the "formal process" list) to fill in any gaps, or introduce ideas to talk around.	Trainer might wish to use some or all of the content in Chapter Five of the Guide - *Developing an Influence Strategy*. At any rate, the three key points listed on page 54 of the Guide could be used as an 'opener' for this session. There would also be room for a discussion of power and influence - and the importance of trust and perceived credibility especially - see pages 56-61.	

ELEMENT/TIMING	ACTIVITY	NOTES	OVER-HEADS
Application to real case Set-up: 5 min Prepare proposal (small groups): 40 min Present back: 15 min Sum up: 10 min	Participants work in small groups, on a real and current potential proposal - possibly an example they have worked on previously on the programme if this session is part of a longer programme. The task is to produce a short but complete written proposal for the case (see notes in right-hand column). Spokespeople (possibly more than one per group) present the detail of their proposal, in plenary session - detailed but quick presentations. Trainer sums up, summarising shared points, illustrating differences and trying to resolve them, and making some suggestions, too, as may be necessary.	If participants could get access to PCs, for typing purposes, that would be good. However, it is probably unnecessary, and participants should be encouraged not to write the whole thing, but to write down all of the salient points, in a succinct, coherent and persuasive way.	
Follow through Optional - not timed	Trainer talks though content of Chapter Seven - Follow Through - of the Guide.		
Sum up and conclude (15 min)	Trainer recaps on what was covered, stressing the formal and informal processes involved, and the need to remain within organisational policy and procedure.	Stress that investment proposal isn't just a short term, project-by-project thing, but an ongoing *process*, of developing ideas, and of making sure the organisation is receptive to them and to the possibility of investing in technical/energy related projects.	

Notes:

- *This session should take (a long) one half-day, and it should serve to make participants ready and able to prepare and present proposals.*
- *It is important to stress that this package does not focus at all on presentation skills. It is assumed that if skill development in this area is required, it can be found either through in-house training and coaching, or via one of the many available courses.*
- *This session could be stand-alone, or it could be part of a longer training programme, in which other specific sessions are added. In either case, it is essential that participants work through current, real-life ideas with potential to become proposals, during the second half of the session. Without this application work, the session would have little point or benefit.*

Notes

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