

HM TREASURY

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# **THE GREEN BOOK**

## **Appraisal and Evaluation in Central Government**

Treasury Guidance

LONDON:TSO

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# PREFACE

The Government is committed to continuing improvement in the delivery of public services. A major part of this is ensuring that public funds are spent on activities that provide the greatest benefits to society, and that they are spent in the most efficient way.

The Treasury has, for many years, provided guidance to other public sector bodies on how proposals should be appraised, before significant funds are committed – and how past and present activities should be evaluated. This new edition incorporates revised guidance, to encourage a more thorough, long-term and analytically robust approach to appraisal and evaluation. It is relevant to all appraisals and evaluations.

Appraisal, done properly, is not rocket science, but it is crucially important and needs to be carried out carefully. Decisions taken at the appraisal stage affect the whole lifecycle of new policies, programmes and projects. Similarly, the proper evaluation of previous initiatives is essential in avoiding past mistakes and to enable us to learn from experience. The Green Book therefore constitutes binding guidance for departments and executive agencies.

This edition of the Green Book is the first which has been preceded and helped by a consultation. The consultation process has proved invaluable in shaping the final guidance. While the results have shown widespread support for the main changes proposed, the consultation has particularly helped in making the guidance clearer and more closely tailored to users' needs.

Amongst the main changes are the following. First, there is a stronger emphasis on the identification, management and realisation of benefits – in short, focusing on the end in sight, right from the beginning. Secondly, the new edition “unbundles” the discount rate, introducing a rate of 3.5% in real terms, based on social time preference, while taking account of the other factors which were in practice often implicitly bundled up in the old 6% real figure. In particular, the new Green Book includes, for the first time, an explicit adjustment procedure to redress the systematic optimism (“optimism bias”) that historically has afflicted the appraisal process. Finally, there is greater emphasis on assessing the differential impacts of proposals on the various groups in our society, where these are likely to be significant.

The Treasury is grateful for the significant contributions to the development of this edition of the Green Book made by many others, working across government and elsewhere. Particular gratitude is due to those who participated in the consultation process and provided such detailed and valuable comments. We hope that the final version reflects the quality of these contributions.



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# INTRODUCTION AND BACKGROUND

## INTRODUCTION

**1.1** All new policies, programmes<sup>1</sup> and projects, whether revenue, capital or regulatory, should be subject to comprehensive but proportionate assessment, wherever it is practicable, so as best to promote the public interest. The Green Book presents the techniques and issues that should be considered when carrying out assessments.<sup>2</sup>

The purpose of the Green Book is to ensure that no policy, programme or project is adopted without first having the answer to these questions:

- Are there better ways to achieve this objective?
- Are there better uses for these resources?

**1.2** This guidance is designed to promote efficient policy development and resource allocation across government. It does this by informing decision-making, and by improving the alignment of departmental and agency policies, programmes and projects with government priorities and the expectations of the public. The guidance emphasises the need to take account of the wider social costs and benefits of proposals, and the need to ensure the proper use of public resources.

**1.3** This is achieved through:

- Identifying other possible approaches which may achieve similar results;
- Wherever feasible, attributing monetary values to all impacts of any proposed policy, project and programme; and
- Performing an assessment of the costs and benefits for relevant options.

The Green Book describes how the economic, financial, social and environmental assessments of a policy, programme or project should be combined.

**1.4** The Green Book is a best practice guide for all central departments and executive agencies, and covers projects of all types and size. It aims to make the appraisal process throughout government more consistent and transparent.

**1.5** When more detailed analysis is required, as signposted throughout the Green Book, reference should be made to the technical advice contained in the annexes. These annexes address the needs of specialist technicians and economists by focusing on some of the more involved aspects of appraisal and evaluation. The annexes contain:

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<sup>1</sup> A programme is defined as a group of related projects

<sup>2</sup> Assessments is the general term used in the Green Book to refer to both appraisals before decisions are made, and evaluations of decisions once made

- ❑ Guidance on the conduct of an advanced appraisal; and,
- ❑ The analytical foundations of the approach contained in the Green Book.

**1.6** Departments and agencies should ensure that their own manuals or guidelines are consistent with the principles contained here, providing supplementary guidance on their specific areas.

**BOX 1: ACTIVITIES COVERED BY THE GREEN BOOK**

Policy and programme development	Decisions on the level and type of services or other actions to be provided, or on the extent of regulation.
New or replacement capital projects	Decisions to undertake a project, its scale and location, timing, and the degree of private sector involvement.
Use or disposal of existing assets	Decisions to sell land, or other assets, replace or relocate facilities or operations, whether to contract out or market test services.
Specification of regulations	Decisions, for example, on standards for health and safety, environment quality, sustainability, or to balance the costs and benefits of regulatory standards and how they can be implemented.
Major procurement decisions	Decisions to purchase the delivery of services, works or goods, usually from private sector suppliers.

**WHEN TO USE THE GREEN BOOK**

**1.7** The Green Book will be useful for:

- ❑ Anyone required to conduct a basic appraisal or evaluation of a policy, project or programme; and,
- ❑ People seeking to expand their knowledge in this area.

**1.8** This guidance applies:

*At the start ...* to any analysis used to support a government decision to adopt a new policy, or to initiate, renew, expand or re-orientate programmes or projects, which would result in measurable benefits and/ or costs to the public. This is the *appraisal* part of the process.

*And at the finish ...* to retrospective analysis of a policy, programme or project at its completion, conclusion or revision. This is the *evaluation* part of the process.

**1.9** The ability to judge how effectively government resources have been expended is essential to their strategic long-term management. Planning for this evaluation should be considered at the time of appraisal.

# OVERVIEW OF APPRAISAL AND EVALUATION

# 2

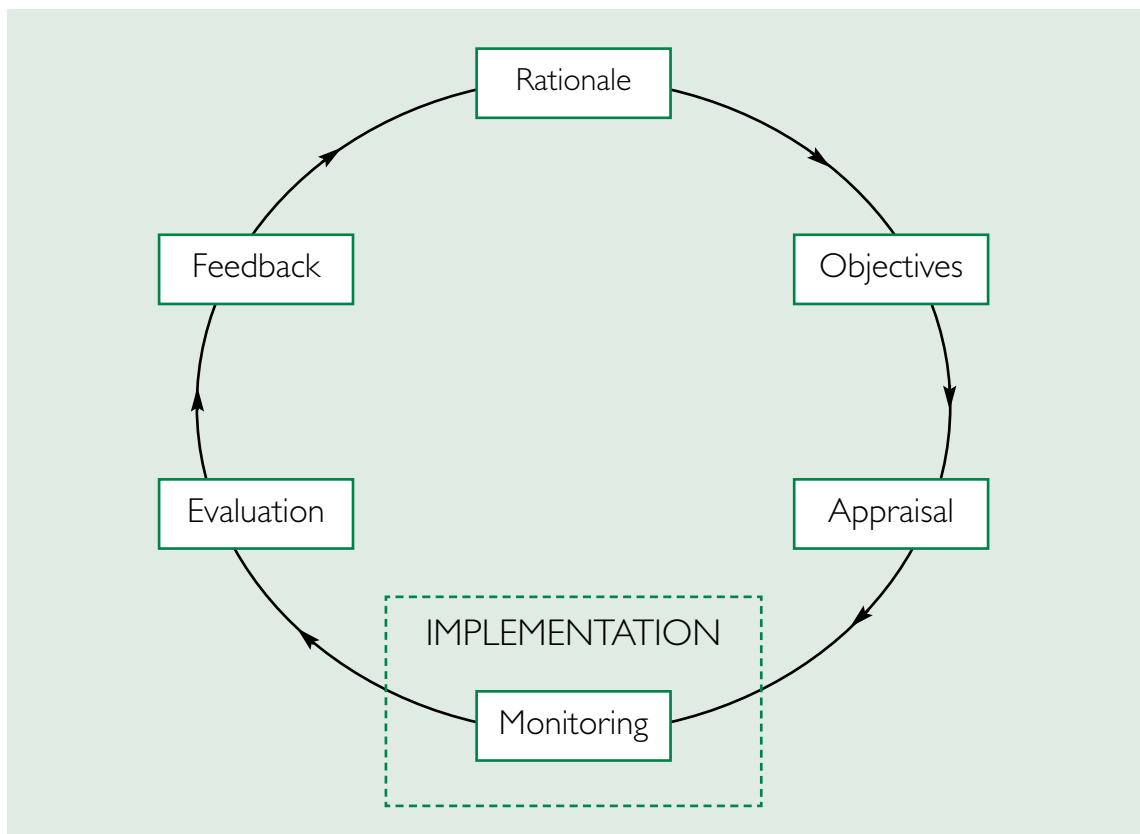
## INTRODUCTION

2.1 This chapter summarises the key stages of appraisal and evaluation. The remaining chapters discuss them in more detail.

## THE APPRAISAL AND EVALUATION CYCLE

2.2 Appraisal and evaluation often form stages of a broad policy cycle that some departments and agencies formalise in the acronym ROAMEF (Rationale, Objectives, Appraisal, Monitoring, Evaluation and Feedback). This is shown below:

### BOX 2: ROAMEF CYCLE



## THE ROLE OF APPRAISAL

2.3 Appraisals should provide an assessment of whether a proposal is worthwhile, and clearly communicate conclusions and recommendations. The essential technique is option appraisal, whereby government intervention is validated, objectives are set, and options are created and reviewed, by analysing their costs and benefits. Within this

framework, cost-benefit analysis is recommended, as contrasted with cost-effectiveness analysis below, with supplementary techniques to be used for weighing up those costs and benefits that remain unvalued.

#### **COST-BENEFIT ANALYSIS**

Analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value.

#### **COST-EFFECTIVENESS ANALYSIS**

Analysis that compares the costs of alternative ways of producing the same or similar outputs.

## **PROCESS FOR APPRAISAL AND EVALUATION**

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**2.4** Appraisals are often iterated a number of times before their proposals are implemented in full. Therefore the stages set out below may be repeated, and they may not always be followed sequentially. In particular, as options are developed, it will usually be important to review more than once the impact of risks, uncertainties and inherent biases. This helps to avoid spurious accuracy, and to provide a reasonable understanding of whether, in the light of changing circumstances, the proposal is likely to remain good value for money.

**2.5** As the stages of an assessment progress, data must be refined to become more specific and accurate. The effort applied at each step should be proportionate to the funds involved, outcomes at stake, and the time available. Accordingly, in the early steps of identifying and appraising options, summary data only is normally required. Later on, before significant funds are committed, the confidence required must increase.

### **Chapter 3 – Justifying Action**

**2.6** The first step is to carry out an overview to ensure that two pre-requisites are met: firstly, that there is a clearly identified need; and secondly, that any proposed intervention is likely to be worth the cost. This overview must include an analysis of the negative consequences of intervention, as well as the results of not intervening, both of which must be outweighed to justify action. In many cases, the preliminary step will involve research to set out the scope of the issue to be addressed, and the reasons for intervention.

### **Chapter 4 – Setting Objectives**

**2.7** The second step is to set out clearly the desired outcomes and objectives of an intervention in order to identify the full range of options that may be available to deliver them. Targets should be set to help progress towards meeting objectives.



## Chapter 5 – Option Appraisal

**2.8** The third step is to carry out an option appraisal. This is often the most significant part of the analysis. Initially a wide range of options should be created and reviewed. This helps to set the parameters of an appropriate solution. A shortlist may then be created to keep the process manageable, by applying the techniques summarised below to high level estimates or summary data. The 'do minimum' option should always be carried forward in the shortlist, to act as a check against more interventionist action.

**2.9** Each option is then appraised by establishing a Base Case<sup>1</sup>. This is the best estimate of its costs and benefits. These estimates can then be adjusted by considering different scenarios, or the option's sensitivity to changes can be modelled by changing key variables. More fully, the appraisal may develop as follows:

- ❑ Identify and value the costs of each option.
- ❑ Identify and value the benefits of each option.
- ❑ If required, adjust the valued costs and benefits for:
  - ❑ Distributional impacts (the effects of proposals on different sections of society);
  - ❑ Relative price movements.
- ❑ Adjust for the timing of the incidence of costs and benefits by discounting them, to obtain their present values.
- ❑ If necessary, adjust for material differences in tax between options.
- ❑ Adjust for risk and optimism to provide the Base Case, and consider the impacts of changes in key variables and of different future scenarios on the Base Case.
- ❑ Consider unvalued impacts (both costs and benefits), using weighting and scoring techniques if appropriate.

## Chapter 6 – Developing and implementing a solution

**2.10** Following option appraisal, decision criteria and judgment should be used to select the best option or options, which should then be refined into a solution. Consultation is important at this stage, regardless of whether it has taken place earlier. Procurement routes should also be considered, including the role of the private sector.

**2.11** Issues that may have a material impact on the successful implementation of proposals must be considered during the appraisal stage, before significant funds are committed. This is to ensure that the outcome envisaged in the appraisal is close to what eventually happens.

## Chapter 7 – Evaluation

**2.12** Evaluation is similar in technique to appraisal, although it obviously uses historic (actual or estimated) rather than forecast data, and takes place after the event. Its main purpose is to ensure that lessons are widely learned, communicated and applied when assessing new proposals.

<sup>1</sup> The term 'Base Case' is sometimes used to refer to the 'do minimum' option, but it is not used in this way in the Green Book.

## PRESENTING THE RESULTS

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**2.130** The ultimate outcome of any appraisal is a decision whether or not to proceed with a proposal or a particular option. As these decisions will often have far reaching consequences, the presentation of the conclusions and recommendations to decision makers and key stakeholders can be as important as the analysis itself. In all cases, transparency is vital. Presentations and reports should be clear, logical, well founded, and geared towards helping the decision at hand. Summary reports in particular should be drafted in non-technical language wherever possible, but, if it is necessary to use technical terms, they should be explained.

**2.14** Reports should provide sufficient evidence to support their conclusions and recommendations. They should provide an easy audit trail for the reader to check calculations, supporting evidence and assumptions. Major costs and benefits should be described, and the values attached to each clearly shown rather than netted off in the presentation of the analysis. This should help to ensure that decision makers understand the assumptions underlying the conclusions of the analysis, and the recommendations put forward. Appraisal reports should contain sufficient information to support the conduct of any later evaluation.

**2.15** The results of sensitivity and scenario analyses should also generally be included in presentations and summary reports to decision makers, rather than just single point estimates of expected values. Decision makers need to understand that there are ranges of potential outcomes, and hence to judge the capacity of proposals to withstand future uncertainty.

### BOX 3: POSSIBLE OUTPUTS OF AN ECONOMIC APPRAISAL OR EVALUATION

- Business cases (either Preliminary, Outline or Full) consisting of:
  - Strategic Case;
  - Economic Case (or Option Appraisal);
  - Financial Case (or Affordability);
  - Commercial Case;
  - Programme;
  - Project Management Case (or Achievability).
- Regulatory Impact Assessment
- Health Impact Assessment
- Environmental Appraisal
- Health and Safety Impact appraisal
- Consumer Impact Assessment
- Integrated Policy Appraisal (IPA)<sup>2</sup>
- Evaluation and audit reports.

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<sup>2</sup>The IPA is a policy tool that attempts to cover all aspects of an appraisal. It provides a checklist of questions on issues such as climate change, air quality, landscape, land use, waste, water, biodiversity and noise. Further guidance is available from ODPM, DEFRA and DfT.

**2.16** Departments and agencies often issue good practice templates for policy and project appraisals and evaluations.<sup>3</sup>

## MANAGING APPRAISALS AND EVALUATIONS

**2.17** Conducting an assessment can be resource-intensive. Appraisals and evaluations should therefore be carried out collaboratively wherever possible between stakeholders, but lead responsibilities need to be well defined, and accountability for accuracy and thoroughness clearly understood. Carrying out assessments should never be regarded as a specialist activity, and therefore sidelined.

**2.18** Departments and agencies should consider how appraisals and evaluations are integrated with decision-making processes and governance structures. To ensure a coordinated approach to conducting assessments, departments and agencies are encouraged to consider:

- ❑ Establishing formal evaluation or assessment units, or other centres of technical expertise;
- ❑ Formalising access to internal and external auditors. In complex cases, it may be helpful to discuss appraisal methodology with sponsor departments, the Treasury or the National Audit Office;<sup>4</sup>
- ❑ Providing incentives for conducting thorough and timely appraisals; and,
- ❑ Maintaining an accessible archive.<sup>5</sup>

**2.19** For individual assessments, consideration needs to be given at the outset to:

- ❑ The availability and cost of financial and specialist resources that may be needed;
- ❑ The possible need for quality assurance, for example, by academic experts and service providers;
- ❑ How the findings are to be disseminated (e.g. publication of assessments; dissemination via web sites, etc);
- ❑ The possibility of deferring a proposal pending further research; and,
- ❑ Establishing a project plan for the assessment, setting out key milestones, resources and work streams.

Advice is available on this guidance from:

- ❑ Departmental analysts, Public Services Delivery Analysis (PSDA) team in HM Treasury, and a variety of referenced sources on specific issues.
- ❑ Training on project and policy assessment is available from a range of sources, including the Civil Service College.

<sup>3</sup> For instance, the OGC provides business case templates on its website, which are recommended for use in project appraisals: <http://www.ogc.gov.uk>

<sup>4</sup> See NAO website: <http://www.nao.gov.uk/>

<sup>5</sup> See CMPS Knowledge Pools (<http://policyhub.gov.uk>), and 'Adding It Up' (<http://www.addingitup.gov.uk/>)

## FRAMEWORKS

2.20 The frameworks below are particularly relevant to appraisals and evaluations:

- ❑ The OGC Gateway Review (mainly for programmes and projects);
- ❑ The Regulatory Impact Assessment (mainly for policies involving regulatory impacts); and
- ❑ The Centre for Management and Policy Studies (CMPS) Policy Hub.

### Office of Government Commerce Gateway Process

2.21 Gateway is a review process for civil procurement projects conducted by the Office of Government Commerce.<sup>6</sup> It examines policies and projects at critical stages in their lifecycle to provide assurance that they can progress successfully to the next stage. Compliance with the Green Book is incorporated into the first and second gateways. Detailed information is available from the OGC website.<sup>7</sup>

### Regulatory Impact Assessment

2.22 A regulatory impact assessment (RIA) is a policy tool that assesses the impact, in terms of costs, benefits and risks of any proposed regulation that could affect businesses, charities or the voluntary sector. It is Government policy that all government departments and agencies where they exercise statutory powers and make rules with general effect on others must produce an RIA. They should also produce an RIA for proposed European legislation that will have an effect on businesses, the public sector, charities or the voluntary sector in the UK<sup>8</sup>.

2.23 Although the trigger for producing an RIA is that the proposal could affect businesses, charities or the voluntary sector, the RIA itself should cover the full range of economic, social and environmental effects, in line with the Green Book methodology.

### The CMPS Policy Hub

2.24 The CMPS Policy Hub<sup>9</sup> aims to improve policy making and delivery, by providing:

- ❑ Tailored access to resources and activities from the UK and abroad that help formulate, develop and evaluate policy more efficiently and effectively;
- ❑ Innovative examples of improved policy making and delivery;
- ❑ Tools to help break down organisational and geographical barriers, and improve collaborative working within and beyond government; and,
- ❑ A platform for promoting the highest standards of research and evaluation.

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<sup>6</sup> Similar processes exist in departments exempt from the Gateway Review Process, for example the Ministry of Defence's 'Smart Acquisition' arrangements. Departments that are exempt should periodically review their monitoring procedures to ensure compliance with the Green Book methodology

<sup>7</sup> OGC website: <http://www.ogc.gov.uk/>

<sup>8</sup> Guidance is available in Better Policy Making and Regulatory Impact Assessment available from the RIU website: <http://www.cabinet-office.gov.uk>

<sup>9</sup> See <http://www.policyhub.gov.uk>

## ISSUES RELEVANT TO APPRAISAL AND EVALUATION

**2.25** There is a wide range of generic issues that may need to be considered as part of any assessment. The following list should be checked for relevance to options under appraisal, and used for later evaluations:

- ❑ Strategic impact – new proposals can be said to have strategic impacts on organisations if they significantly affect the whole or major part of an organisation over the medium to long term. Proposals should therefore be considered in terms of their potential scale of impact, and how they fit in with the strategy of the organisation(s) they affect.
- ❑ Economic rationale – proposals need to be underpinned by sound economic analysis, which should be provided by a cost benefit analysis in an option appraisal. See Chapter 5 in particular.
- ❑ Financial arrangements and affordability – proposals need to be affordable, and an affordable financial plan needs to be developed. See Chapter 6.
- ❑ Achievability – all proposals should be assessed for their achievability, and recognised programme and project management arrangements set up as necessary. See Chapter 6.
- ❑ Commercial and partnering arrangements – proposals need to take account of commercial, partnering and procurement arrangements; what can be delivered in the market; how costs and benefits can be guaranteed through commercial arrangements; how contracts will be managed through to completion. See Chapter 6.
- ❑ Regulatory impact – as discussed previously, the impacts of new proposals on businesses, voluntary sector and charities should be assessed. See Chapter 2.
- ❑ Legislation – consideration should be given to legislation specific to the case in hand, as well as statutes that affect many proposals, such as the Human Rights Act, or the Data Protection and Freedom of Information Acts.
- ❑ Information management and control – The information requirements of proposals, including the data needed for later evaluation, and the supporting IT that may be required. Further guidance is available from the OGC.<sup>10</sup>
- ❑ Environmental impacts – The effects on the environment should be considered, including air and water quality, land use, noise pollution, and waste production, recycling and disposal. Further guidance is available from ODPM, Defra and DfT.
- ❑ Rural issues – The government is committed to ensuring that all its policies take account of specific rural circumstances. Appraisers should assess whether proposals are likely to have a different impact in rural areas from elsewhere. Further guidance is available from Defra.<sup>11</sup>
- ❑ Equality – Impacts on various groups in society should be considered as part of an appraisal. Chapter 5 describes how distributional impacts should be brought into the appraisal process.

<sup>10</sup> See <http://www.ogc.gov.uk>

<sup>11</sup> See <http://www.defra.gov.uk>

- ❑ Health – the impacts of proposals on health should be considered, and evaluation made of the impact on health of poverty, deprivation and unemployment, as well as poor housing or workplace conditions. The Department of Health can provide further advice<sup>12</sup>, or can be accessed via the policy hub.<sup>13</sup>
- ❑ Health and safety – the health and safety of people at work or arising from work activity may need to be safeguarded. Obviously this is of particular concern in construction. The Health and Safety Commission can provide further advice.<sup>14</sup>
- ❑ Consumer focus – Assessments may need to involve consideration of the cost and quality of goods and services, as well as access to, choice of, and information about them.<sup>15</sup>
- ❑ Regional perspectives – CMPS provides guidance on how regional perspectives are best incorporated into the policy making process.<sup>16</sup>
- ❑ European Union – It will often be important to take account of proposals and activities in other European Union countries, as well as specific legislation and regulations. State aid rules are particularly important to consider, as these prescribe the extent to which government can intervene.<sup>17</sup>
- ❑ Design quality – The design quality of facilities can be important in ensuring that objectives are successfully achieved.<sup>18</sup>

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<sup>12</sup> See <http://www.doh.gov.uk>

<sup>13</sup> See <http://www.policyhub.gov.uk>

<sup>14</sup> See <http://www.hse.gov.uk>

<sup>15</sup> See <http://www.policyhub.gov.uk>

<sup>16</sup> See <http://www.policyhub.gov.uk>

<sup>17</sup> See <http://www.dti.gov.uk>

<sup>18</sup> See <http://www.cabe.org.uk>

# JUSTIFYING ACTION

## INTRODUCTION

**3.1** Before any possible action by government is contemplated, it is important to identify a clear need which it is in the national interest for government to address. Accordingly, a statement of the rationale for intervention should be developed.

Key questions for justifying action:

- Is the rationale for intervention clear?
- Is it reasonable to assume that intervention will be cost-effective: i.e. that the benefits of intervention will exceed the costs?

## REASONS FOR GOVERNMENT INTERVENTION

**3.2** This underlying rationale is usually founded either in market failure or where there are clear government distributional objectives that need to be met. Market failure refers to where the market has not and cannot of itself be expected to deliver an efficient outcome; the intervention that is contemplated will seek to redress this. Distributional objectives are self-explanatory and are based on equity considerations.

**3.3** Government intervention can incur costs and create economic distortions. These must be taken into account to determine whether intervention is warranted. For example, a regulation may be successful in addressing a particular market failure, but might also involve other costs that mean that overall it is not worthwhile.

## CARRYING OUT RESEARCH

**3.4** The first step in appraisal is usually to carry out research, to identify the scope of the issues involved and the basis for government action. The research may cover the following:

- The result if nothing changed, or if there was minimal change;
- The market situation (e.g. cause of any market failure, employment levels);
- Current and projected trends and published forecasts (e.g. population, services volume, demand, relative prices and costs);
- Potential beneficiaries (and those who may be disadvantaged);
- Technological developments; and,
- Whether the problem to be addressed changes in scope or magnitude over time e.g., effects can multiply over generations.

3.5 Determining the rationale for government intervention is discussed further in Annex I.

3.6 Box 4 provides an illustrative example to demonstrate the reasoning and evidence that would be required to justify government intervention.

#### **BOX 4: EXAMPLE 'EXPANDING VOCATIONAL TRAINING'**

There is evidence that skilled workforces have positive impacts on high-level economic aims, such as productivity and GDP growth. At the same time, there is evidence of a major skills deficiency in the UK, which is reflected in the low numbers holding intermediate level vocational qualifications, compared to Germany and other European countries. There is further evidence that there are three forms of market failure that continue to cause this skills gap:

1. Externalities leading to under-investment in training by employers. Firms are concerned that once trained, an employee will leave the firm before the firm has recouped its investment. Unless training pays off very quickly, firms are therefore reluctant to provide training to their workers.
2. Imperfect information leading to employees being unable to judge the quality of their training or appreciate the benefits. This reduces their willingness to accept lower wages during the training period or to receive any training at all.
3. Credit market imperfections. Training is costly, but individuals expect to obtain higher wages from training. Some individuals may wish to borrow to fund training in the expectation that they will be able to pay back the loan through higher future wages. However, low-paid employees in particular are likely to be credit constrained and unable to obtain loans to pay for training.

These market failures mean that the level of training provided by the market is likely to be inefficiently low from society's point of view. Well-designed government intervention may help to bridge the gap.



# SETTING OBJECTIVES

# 4

## INTRODUCTION

**4.1** If an intervention seems worthwhile, then the objectives of the proposed new policy, programme or project need to be stated clearly. This allows the identification of the full range of alternative options which government may adopt.

## OBJECTIVES, OUTCOMES, OUTPUTS, AND TARGETS

**4.2** Objectives should be stated so that it is clear what proposals are intended to achieve. Objectives may be expressed in general terms so that the range of options to meet them can be considered. The objectives of individual proposals should be consistent with statements of government policy, departmental or agency objectives, departmental Public Service Agreements (PSAs), and wider macro-economic objectives.

**4.3** There is usually a hierarchy of outcomes, outputs, and targets that should be clearly set out in an appraisal. Outcomes are the eventual benefits to society that proposals are intended to achieve. Often, objectives will be expressed in terms of the outcomes that are desired. But outcomes sometimes cannot be directly measured, in which case it will often be appropriate to specify outputs, as intermediate steps along the way. Outputs are the results of activities that can be clearly stated or measured and which relate in some way to the outcomes desired.

**4.4** Targets can be used to help progress in terms of producing outputs, delivering outcomes, and meeting objectives. Targets should be SMART;

- S**pecific,
- M**easurable,
- A**chievable,
- R**elevant, and,
- T**ime-bound.

**BOX 5: SETTING OBJECTIVES AND TARGETS**

The following questions may help to set suitable objectives and targets:

- What are we trying to achieve? What are our objectives? What would constitute a successful outcome or set of outcomes?
- Have similar objectives been set in other contexts that could be adapted?
- Are our objectives consistent with strategic aims and objectives as set out, for example, in the department's Public Service Agreements (PSA's)?
- Are our objectives defined to reflect outcomes (e.g., improved health, crime reduction or enhanced sustainable economic growth,) rather than the outputs (e.g. operations, prosecutions or job placements), which will be the focus of particular projects?
- How might our objectives and outcomes be measured?
- Are our objectives defined in such a way that progress toward meeting them can be monitored?
- What factors are critical to success?
- What SMART targets can we then set? What targets do we need to meet?

**BOX 6: EXAMPLES OF OUTPUTS AND OUTCOMES**

Policy area	Outputs	Outcomes
Job search / Job matching	Number of job seekers assisted.	Value of extra output, or improvement in efficiency of job search
Development of skills	Number of training places and / or numbers completing training	Value of extra human capital, and / or earnings capacity
Social outputs: Schools; Health centres	Exam results (schools), People treated (health centres).	Improvements in human capital (schools); Measures of health gain (health centres).
Environmental improvement	Hectares of derelict land freed of pollution.	Improvement to the productivity of the land.

**BOX 7: EXAMPLE ‘EXPANDING VOCATIONAL TRAINING’****OVERALL POLICY OBJECTIVE**

‘To address the major skills deficiency in the UK by increasing training to be reflected in the numbers of people holding vocational qualifications’.

See Box 4 for the rationale for government intervention.

Examples of outcomes, outputs and targets:

Outcomes	Outputs	Targets
A socially optimal level of training	Human capital as a share of GDP	The number of training places that will be provided by a certain date
Higher productivity for both trainees and co-workers	Proportion of workforce with vocational training	Reduction in the percentage drop-out rate by a certain date



# APPRAISING THE OPTIONS

# 5

## INTRODUCTION

**5.1** The purpose of option appraisal is to help develop a value for money solution that meets the objectives of government action. Creating and reviewing options helps decision-makers understand the potential range of action that they may take.

**5.2** The approach set out here explains how options can be created, and values estimated for the Base Case (i.e. the best estimate of the costs and benefits of an option). It goes on to state how the Base Case may be adjusted to account for uncertainty about the future, using sensitivity and scenario analyses, and how to consider non-monetised impacts.

## CREATING OPTIONS

**5.3** This step involves preparing a list of the range of actions which government could possibly take to achieve the identified objectives. The list should include an option where government takes the minimum amount of action necessary (the 'do minimum option'), so that the reasons for more interventionist actions can be judged.

**5.4** The range of options depends on the nature of the objectives. For a major programme, a wide range should be considered before short-listing for detailed appraisal. Both new and current policies, programmes and projects should be included as options. At the early stages, it is usually important to consult widely, either formally or informally, as this is often the best way of creating an appropriate set of options.

**5.5** An option may affect, or be affected by, other expenditure across the public sector (for example, where its outputs or costs depend upon another project or the implementation of a related policy perhaps in another department). Where a number of expenditures or activities are linked together and the costs or benefits are mutually dependent, the proposal must be appraised as a whole. However, the contribution of the component parts of each proposal to achieving overall value for money must be taken into account.

### **BOX 8: CREATING OPTIONS**

Establishing a range of options can be challenging. The following actions are suggested:

- Research existing reports, and consult widely with practitioners and experts, to gather the set of data and information relevant to the objectives and scope of the problem.
- Analyse the data to understand significant dependencies, priorities, incentives and other drivers.
- From the research, identify best practice solutions, including international examples if appropriate.
- Consider the full range of issues likely to affect the objective.
- Identify the full range of policy instruments or projects that may be used to meet the objectives. This may span different sorts or scales of intervention; regulatory (or deregulatory) solutions may be compared with self-regulation, spending or tax options.

### BOX 8: CREATING OPTIONS (contd)

- ❑ Develop and consider radical options. These options may not become part of the formal appraisal but can be helpful to test the parameters of feasible solutions. Well-run brainstorming sessions can help to generate such a range of ideas.

### BOX 9: EXAMPLES OF OPTIONS

Examples of strategic and operational options include:

- ❑ Varying time and scale
- ❑ Options to rent, build or purchase
- ❑ Changing the combination of capital and recurrent expenditure
- ❑ Refurbishing existing facilities or leasing and buying new ones
- ❑ Co-operating with other parts of government
- ❑ Changing locations or sites
- ❑ Provision of the service, such as maintenance, or facility by the private sector
- ❑ Co-locating, or sharing facilities with other agencies
- ❑ Using IT to improve delivery, as part of wider organisational changes
- ❑ Transferring service provision to another body, or improving partnership arrangements
- ❑ Varying the balance between outsourcing and providing services (or retaining expertise in-house)
- ❑ Engaging the voluntary sector
- ❑ Regulation, including private sector self regulation, and voluntary action
- ❑ Different standards or compliance procedures for different groups (e.g. large and small businesses)
- ❑ Varying quality targets
- ❑ Different degrees of compulsion, accreditation, monitoring, and inspection regimes, including voluntary codes, approved codes of practice or government regulation
- ❑ Action at a regional, national, or international level (e.g. European wide)
- ❑ Better implementation of existing measures or initiatives
- ❑ Information campaigns
- ❑ Deregulation and non-intervention
- ❑ Changes that will be permanent in the foreseeable future, or initiatives with specified time horizons.

## Short-listing options

**5.6** A shortlist of options may be created, partly to keep the appraisal process manageable, usually at the preliminary stages of a policy appraisal, or during the strategic outline business case stage for a capital investment appraisal. However, there is a risk that the process of short-listing will eliminate the optimal solution before it is given full consideration. Therefore, shortlists should still try to cover a wide range of potential action.

**5.7** The shortlist must always include the 'do minimum' option. Reasons behind the rejection of each excluded option should be recorded.

# VALUING THE COSTS AND BENEFITS OF OPTIONS

## Introduction

**5.8** The relevant costs and benefits to government and society of all options should be valued, and the net benefits or costs calculated. The decision maker can then compare the results between options to help select the best. It is important to avoid being spuriously accurate when concluding from, and presenting the results of, data generated by the appraisal. However, the confidence in the data provided by the analysis will need to increase, depending on the importance or scale of the decision at hand (for instance, depending on how much resource will be committed by the decision).

**5.9** In this context, relevant costs and benefits are those that can be affected by the decision at hand. Although they will vary depending on the scope of the proposal, some general principles apply. It is useful early on in the appraisal process to consider widely what potential costs and benefits may be relevant.

**5.10** Costs and benefits considered should normally be extended to cover the period of the useful lifetime of the assets encompassed by the options under consideration, although, if the appraisal concerns the contractual purchase of outputs and outcomes (e.g. in PFI), the appraisal period may be different.

**5.11** Costs and benefits should normally be based on market prices as they usually reflect the best alternative uses that the goods or services could be put to (the opportunity cost). However, market prices may need to be adjusted for tax differences between options.

**5.12** Wider social and environmental costs and benefits for which there is no market price also need to be brought into any assessment. They will often be more difficult to assess but are often important and should not be ignored simply because they cannot easily be costed. Annex 2 provides more information on how to take into account the wider impacts of proposals.

**5.13** Cashflows and resource costs are also important in an appraisal, as these inform the assessment of the affordability of a proposal. However, they do not provide the opportunity cost and, therefore, cannot be used to understand the wider costs and benefits of proposals. Proposals are also likely to require resource budgets, so that it is clear how they will be funded, and, ex post, accounted for. Chapter 6 provides more information on resource budgets and the other accounting requirements of appraisals.

## Estimating costs

**5.14** Costs should be expressed in terms of relevant opportunity costs. It is important to explore what opportunities may exist. An example of an opportunity is to use land in a different, more valuable, way than in its current use. Another is the alternative use of an employee's time. Full time equivalent (FTE) costs should be used to estimate the costs of employees' time to the employer<sup>1</sup>, and should include pensions, national insurance and allowances, as well as basic salaries.

**5.15** Costs of goods and services that have already been incurred and are irrevocable should be ignored in an appraisal. They are 'sunk costs'. What matters are costs about which decisions can still be made. However, this includes the opportunity costs of continuing to tie up resources that have already been paid for.

**5.16** It can be useful to distinguish between fixed, variable, semi-variable and step costs:

- Fixed costs remain constant over wide ranges of activity for a specified time period (such as an office building);
- Variable costs vary according to the volume of activity (external training costs, for example, varying with the number of trainees);
- Semi-variable costs include both a fixed and variable component (maintenance is an example, where there is usually a set planned programme, and a responsive regime whose costs vary in proportion to activity, i.e. the number of call-outs); and,
- Semi-fixed, or step costs, are fixed for a given level of activity but they eventually increase by a given amount at some critical point (after telephone call volumes reach a certain level, a new call centre may be required).<sup>2</sup>

**5.17** Categorising costs in this way can aid sensitivity analysis, but the categorisation should be used carefully. A cost that is fixed relative to one factor may change with another. More complex modelling may be required to describe how costs change over time and with different variables.

**5.18** For substantial proposals, the relevant costs are likely to equate to the full economic cost of providing the associated goods and services, and for these proposals, the full economic cost should be calculated, net of any expected revenues, for each option. The full cost includes direct and indirect costs, and attributable overheads. The full cost of the Base Case, as built up in this way, should also equal the total of the analysis of costs into their fixed, variable, semi-variable and stepped elements. A dual cost analysis of this kind enables opportunity costs to be fully considered, and sensitivity analysis to be conducted later on.

**5.19** Appraisals leading to short-term or non-strategic decisions are likely to have a smaller set of relevant costs. The relevant costs are likely to be those that are marginal to the organisation's overall activity.

**5.20** Cost estimation can be difficult, depending on the class of costs under consideration. It will normally involve input from accountants, economists and other specialists, depending on the type of appraisal. The appraiser needs to understand and communicate clearly the scope of the appraisal to ensure that specialists provide relevant cost information, whilst ensuring that opportunities have been thoroughly explored.

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<sup>1</sup> See Annex 2 on the valuation of time to society.

<sup>2</sup> Definitions are taken from Drury (1998)



**5.21** Depreciation and capital charges should not be included in an appraisal of whether or not to purchase the asset that would give rise to them (although for resource budgeting purposes they may be important). Depreciation is an accounting device used to spread the expenditure on a capital asset over its lifetime. Capital charges reflect the opportunity cost of funds tied up in capital assets, once those assets have been purchased. They are used to help test the value for money of retaining an asset. They should not be included in the decision whether or not to purchase the asset in the first place.

**5.22** Even where an appraisal covers the full expected period of use of an asset, the asset may still have some residual value, in an alternative use within an organisation, in a second-hand market, or as scrap. These values should be included, and tested for sensitivity, as it may be difficult to estimate the future residual value at the present time.

**5.23** Some projects expose the government to contingent liabilities – that is commitments to future expenditure if certain events occur. These should be appraised (and monitored if the proposal goes ahead). One class of contingent liabilities is the cancellation costs for which the government body may be liable if it terminates a contract prematurely. Such liabilities, and the likelihood of their coming about, must be taken into account in appraising the initial proposal. Redundancy payments fall into this category, but as the wider social and economic consequences of these should also be assessed, advice from economists should be sought.<sup>3</sup>

## Estimating the value of benefits

**5.24** The purpose of valuing benefits is to consider whether an option's benefits are worth its costs, and to allow alternative options to be systematically compared in terms of their net benefits or net costs. The general rule is that benefits should be valued unless it is clearly not practicable to do so. Even if it is not feasible or practicable to value all the benefits of a proposal, it is important to consider valuing the differences between options.

**5.25** In principle, appraisals should take account of all benefits to the UK.<sup>4</sup> This means that as well as taking into account the direct effects of interventions, the wider effects on other areas of the economy should also be considered. These effects should be analysed carefully as there may be associated indirect costs, such as environmental costs, which would also need to be included in an appraisal. In all cases, these wider effects should be clearly described and considered.

**5.26** Real or estimated market prices provide the first point of reference for the value of benefits. There are a few exceptions where valuing at market prices is not suitable. If the market is dominated by monopoly suppliers, or is significantly distorted by taxes or subsidies, prices will not reflect the opportunity costs and adjustments may be required and specialist economic advice will be needed. An example of this is the effect of EU subsidies on the market for agricultural land.

**5.27** The results of previous studies may sometimes be used to estimate the economic value of changes stemming from current programmes or policies. There will be increasing scope for using this 'benefit transfer' method as databases expand, though care must be taken to allow for different circumstances. The characteristics of the consumers or client group for which data exist may differ from those of the proposal under consideration. These factors can limit the extent to which values can be transferred or generalised.

<sup>3</sup> Redundancy payments are also examples of transfer payments, which are those for which no good or service is obtained in return. Transfer payments may change the distribution of income or wealth, but do not give rise to direct economic costs.

<sup>4</sup> All impacts (including costs and benefits, both direct and indirect) on non-UK residents and firms should be identified and quantified separately where it is reasonable to do so, and if such impacts might affect the conclusions of the appraisal. Generally, proposals should not proceed if, despite a net benefit overall, there is a net cost to the UK (for instance, after taking into account environmental costs).

**5.28** In the absence of an existing robust (i.e. reliable and accurate) monetary valuation of an impact, a decision must be made whether to commission a study, and if so how much resource to devote to the exercise. Annex 2 sets out the key considerations that may govern a decision to commission research.

**5.29** Where it is concluded that a research project to determine valuations is not appropriate, a central estimate, together with a maximum and minimum plausible valuation, should be included. These figures should be included in sensitivity analyses to give assurance that benefit valuation is not critical to the decision to be made. A plausible estimate of the value of a benefit or cost can often be drawn out by considering a range of issues which are summarised in Annex 2.

## Valuing costs and benefits where there is no market value

**5.30** Most appraisals will identify some costs and benefits for which there is no readily available market data. In these cases, a range of techniques can be applied to elicit values, even though they may in some cases be subjective. There will be some impacts, such as environmental, social or health impacts, which have no market price, but are still important enough to value separately.

**5.31** Box 10 summarises the main techniques that can be used to elicit these values. Annex 2 describes these techniques in more detail, and provides further information on how they are being applied in practice.

**BOX 10: VALUATION TECHNIQUES**

Determine whether

Impacts can be measured and quantified

**AND**

Prices can be determined from market data

If this cannot be readily done

Use 'Willingness to Pay' for a benefit

'willingness to pay'

determined by

Inferring a price from observing consumer behaviour

'revealed preference' or a subset of this called 'hedonic pricing'

If this does not provide values, determine whether:

Willingness to pay can be estimated by asking people what they would be willing to pay for a particular benefit

'stated preference'

or whether

In the case of a cost: identifying the amount of compensation consumers would demand in order to accept it

'willingness to accept'

## ADJUSTMENTS TO VALUES OF COSTS AND BENEFITS

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**5.32** Adjustments will often be required to take account of distributional impacts, and relative price changes to develop the Base Case. As for all adjustments, they should be shown separately, clearly and explicitly in any supporting tables of data.

### Distributional analysis

**5.33** It is important that the distributional implications of each option are considered during appraisal. This type of analysis enhances the understanding of the fairness of proposals, their social impacts and their scale.

**5.34** The impact of a policy, programme or project on an individual's well-being will vary according to his or her income; the rationale being that an extra pound will give more benefit to a person who is deprived than to someone who is well off. In economics, this concept is known as the 'diminishing marginal utility of additional consumption'.

**5.35** Other distributional issues may also arise, and should be considered during appraisal. A proposal may have differing impacts according to age, gender, ethnic group, health, skill, or location. These effects should be explicitly stated and quantified wherever feasible. For example, the costs and benefits of a proposal might be broken down according to the ethnic group they accrue to, providing appraisers with a basis for comparison and analysis.

**5.36** Generally though, these other distributional issues are largely correlated with income. Therefore, if more in depth analysis is undertaken, it should focus on how the cost and benefits of a proposal are spread across different socio-economic groups.

**5.37** For the purposes of project appraisal, relative prosperity may often be best defined by relative income, adjusted for household size, and divided into quantiles (e.g. quintiles or deciles).<sup>5</sup> The equity impact of competing options can be compared by charting the impact each has on different 'quantiles' of the income distribution. Proposals that deliver greater net benefit to households or individuals in lower income quantiles are rated more favourably than those that benefit higher quantiles.

**5.38** A more in depth analysis uses distributional weights to adjust explicitly for distributional impacts in the cost-benefit analysis. Benefits accruing to households in a lower quantile would be weighted more heavily than those that accrue to households in higher quantiles. Conversely, costs would be weighted more heavily for households in lower quantiles. Annex 5 provides further guidance in this area.

**5.39** A project aiming to improve market efficiency through the correction of market failure needs also to consider equity outcomes. In this case, an explicit adjustment would be particularly helpful as an equity check for the proposal. Similarly, an adjustment is desirable when faced with a decision between competing equity motivated projects, aimed at regenerating areas containing different socio-economic populations.

**5.40** Applying an explicit distributional adjustment requires quite detailed information about the affected population. A judgement must be made as to whether the necessary socio-economic information is available at an acceptable cost, given the importance of the proposal and the likely scale of the impact of distributional analysis.

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<sup>5</sup>The relative prosperity of a household depends on its size and composition as well as income. The varying costs of living of different households can be adjusted for by calculating equivalised income ranges. Further detail is provided in Annex 5.

**5.41** Where appraisers decide not to adjust explicitly for distributional impacts, they must provide a justification for this decision. This judgement should be informed by the following considerations:

- ❑ The significance of the impact of distributional analysis to the proposal under consideration;
- ❑ The ease with which distributional impacts can be measured; and
- ❑ The scale of the impact associated with a particular project or proposal.

## Adjusting for relative price changes

**5.42** The valuation of costs or benefits should be expressed in 'real terms' or 'constant prices' (i.e. at 'today's' general price level), as opposed to 'nominal terms' or 'current prices'.

**5.43** If necessary, the effect of expected future inflation in the general price level should be removed by deflating future cash flows by forecast levels of the relevant deflator. Over a long-term period, the Bank of England's annual inflation target<sup>6</sup> is the appropriate measure of prices to use as a general deflator.

**5.44** Where particular prices are expected to increase at significantly higher or lower rate than general inflation, this *relative* price change should be calculated. Examples where relative price changes may be material to an appraisal include:

- ❑ High technology products, prices for which may be expected to fall in real terms;
- ❑ Fuel prices, where the resource supply is scarce; and
- ❑ Wages, where productivity growth is expected to lead to wage increases above general inflation.<sup>7</sup>

**5.45** It is helpful when anticipating relative price movements, to consider whether the value of a benefit or a cost will rise as incomes increase. The most direct evidence for this is evidence about how, in fact, revealed preference or stated preference valuations of the benefit in question have increased with income over time. In some cases there is reason to expect that the value of a benefit or cost will rise as incomes increase, for example because the good is in fixed supply (such as certain environmental assets), or because the units in which it is measured are such that its utility value can be expected to remain broadly constant, regardless of changes in income. In the absence of definitive data, the rate of increase in the real value of the benefit should be assumed to be positive, and only in unusual circumstances would it exceed the projected rate of increase of per capita real income.<sup>8</sup> Where these assumptions are critical, they should be tested against any specific evidence.

**5.46** For other costs and benefits, the factors listed below might be considered in determining whether their value would change by more or less than inflation.

- ❑ Scarcity. If a good is exhaustible, its relative price may be expected to rise at a faster rate than general prices, as it becomes increasingly scarce. Against this, developing technologies may enable more of a good to be extracted than initially thought possible.

<sup>6</sup> Currently set by the Government at 2.5%.

<sup>7</sup> HM Treasury (2002), 'Trend Growth: Recent Developments and Prospects', projected trend productivity growth of 2%

<sup>8</sup> Any reduction in the discount rate in the longer term should be linked to a proportional decrease in the projected rate of growth of income.

- ❑ Substitutability. Where plenty of substitutes are available, any scarcity impact may be largely offset. Consideration should be given to whether substitutes are likely to develop over time, particularly in the case of exhaustible goods.
- ❑ Non-linearity. Some of the damage resulting from pollutants, for example, will be non-linear. If the quantity of a pollutant changes over time, this non-linearity will affect the rate at which its relative price changes.
- ❑ Increasing competition, or the removal of monopoly powers, would increase the availability of goods and services, and relative prices may be expected to decline.
- ❑ Economies of scale. If the size of the market for a particular good or service increases, then there is a greater potential for economies of scale, and relative prices may then also be expected to reduce.

5.47 Advice on likely relative price movements should be obtained from the appropriate expert bodies and from finance divisions or economists.

## DISCOUNTING

5.48 Discounting is a technique used to compare costs and benefits that occur in different time periods. It is a separate concept from inflation, and is based on the principle that, generally, people prefer to receive goods and services now rather than later. This is known as 'time preference'.

5.49 For individuals, time preference can be measured by the real interest rate on money lent or borrowed. Amongst other investments, people invest at fixed, low risk rates, hoping to receive more in the future (net of tax) to compensate for the deferral of consumption now. These real rates of return give some indication of their individual pure time preference rate. Society as a whole, also prefers to receive goods and services sooner rather than later, and to defer costs to future generations. This is known as 'social time preference'; the 'social time preference rate' (STPR) is the rate at which society values the present compared to the future.

**The discount rate is used to convert all costs and benefits to 'present values', so that they can be compared. The recommended discount rate is 3.5%. Calculating the present value of the differences between the streams of costs and benefits provides the net present value (NPV) of an option. The NPV is the primary criterion for deciding whether government action can be justified.**

5.50 The mathematical expressions used to calculate discounted present values are set out in the footnote below.<sup>9</sup>

<sup>9</sup>Year 0 is the present. Accordingly, the present value, at the middle of year 0, of a payment of £1 made at the middle of year n is given by:

$$D_n = \frac{1}{(1+r)^n}$$

where r is the discount rate and D<sub>n</sub> is the discount factor. For example, a payment of £150 at the middle of year 5 has a present value at the middle of year 0 of:

$$£150 \times \frac{1}{(1.035)^5} = £150 \times 0.8420 = £126.30$$

**5.51** For projects with very long-term impacts, over thirty years, a declining schedule of discount rates should be used rather than the standard discount rate. The schedule of long term discount rates is shown in Annex 6.

**5.52** Annex 6 also explains the derivation of the social time preference rate, why the rate declines over time, and the circumstances when exceptions to the standard discount rates are allowed.

**5.53** Table 1 shows how the present value of £1,000 declines in future years with a discount rate of 3.5 per cent. More detailed discount rate tables are provided in Annex 6.

**TABLE 1: PRESENT VALUES AND DISCOUNT RATE**

<b>Time (mid year)</b>	0	1	2	3	4	5	6	7	8	9	10
<b>PV of payment (mid year)</b>	£1,000	£966	£934	£902	£871	£842	£814	£786	£759	£734	£709

## Required Rates of Return and Pricing Rules

**5.54** Some central government bodies sell goods or services commercially, including to the government itself. These activities may be controlled by requiring prices to be set to provide a required rate of return (RRR) on the capital employed by the activity as a whole. Government policy is generally to set charges for goods and services sold commercially at market prices, and normally to recover full costs for monopoly services, (including the cost of capital as defined in the Treasury Fees and Charges Guide)<sup>10</sup>.

<sup>10</sup> An update of the Guide is expected to appear on the Treasury website during 2003

**BOX 11: CALCULATING THE NPV**

Alternative projects, A and B, are both expected to improve the quality of a department's work and reduce staff costs. The Base Case of each is being estimated.

**Option A** requires £10 million in initial capital expenditure to realise benefits of £2.5 million per annum for the following four years (£2 million in reduced staff costs and £0.5 million in quality improvements).

**Option B** requires £5 million in initial capital expenditure to realise benefits of £1.5 million per annum for the following four years (£1 million reduced staff costs and £0.5 million in quality improvements).

**Calculation of Present values**

Year	0	1	2	3	4	NPV
Discount Factor	1	0.9962	0.9335	0.9019	0.8714	
<b>Option A</b>						
Costs/Benefits (£)	-10.00m	2.50m	2.50m	2.50m	2.50m	
Present Value (£)	-10.00m	2.42m	2.33m	2.25m	2.18m	<b>-0.82m</b>
<b>Option B</b>						
Costs/Benefits (£)	-5.00m	1.50m	1.50m	1.50m	1.50m	
Present Value (£)	-5.00m	1.45m	1.40m	1.35m	1.31m	<b>0.51m</b>

Project B yields a positive net present value of £0.51m compared to -£0.82m for project A and zero for the implicit 'do minimum' alternative. Therefore Project B is preferable.

**ADJUST FOR DIFFERENCES IN TAX BETWEEN OPTIONS**

**5.55** The adjustment of market prices for taxes in appraisal is appropriate where it may make a material difference to the decision. In practice, it is relatively rare that adjustments for taxation are required, because similar tax regimes usually apply to different options. It can also be difficult in practice to estimate costs net of tax. However, where the tax regimes applying to different options vary substantially, this should not be allowed to distort option choice. In such cases it is important to adjust for any differences between options in the incidence of tax arising from different contractual arrangements, such as in-house supply versus buying in, or lease versus purchase. Options attracting different VAT rates, for example, should be compared as if either the same VAT payments, or no payments were made in all cases.

**5.56** Where publicly financed options are compared to PFI options, taxation differences should be considered, and adjustments explicitly made if not doing so would materially distort the decision. Specific guidance is available on the Treasury Green Book homepage on how to do this in practice.

**INTRODUCTION TO RISK AND UNCERTAINTY**

**Introduction**

**5.57** In appraisals, there is always likely to be some difference between what is expected, and what eventually happens, because of biases unwittingly inherent in the appraisal, and risks and uncertainties that materialise. As a



result, risk management strategies should be adopted for the appraisal and implementation of large policies, programmes or projects, but their principles can be applied to smaller proposals.

**5.58** Appraisers should calculate an expected value of all risks for each option, and consider how exposed each option is to future uncertainty. Before and during implementation, steps should be taken to prevent and mitigate both risks and uncertainties. It is important to be transparent with sponsors about the potential impact of risks and bias on their proposals.

## Risk management

**5.59** Risk management is a structured approach to identifying, assessing and controlling risks that emerge during the course of the policy, programme or project lifecycle. Its task is to ensure an organisation makes cost-effective use of a risk process that has a series of well-defined steps to support better decision-making through good understanding of the risks inherent in a proposal and their likely impact. Risk management involves:

- ❑ Identifying possible risks in advance and putting mechanisms in place to minimise the likelihood of their materialising with adverse effects;
- ❑ Having processes in place to monitor risks, and access to reliable, up-to-date information about risks;
- ❑ The right balance of control in place to mitigate the adverse consequences of the risks, if they should materialise; and,
- ❑ Decision-making processes supported by a framework of risk analysis and evaluation.

**5.60** Annex 4 provides more information on risk management.

## ADJUSTING FOR BIAS AND RISKS

### Optimism bias

**5.61** There is a demonstrated, systematic, tendency for project appraisers to be overly optimistic. This is a worldwide phenomenon that affects both the private and public sectors.<sup>11</sup> Many project parameters are affected by optimism – appraisers tend to overstate benefits, and understate timings and costs, both capital and operational.

**5.62** To redress this tendency, appraisers should make explicit adjustments for this bias. These will take the form of increasing estimates of the costs and decreasing, and delaying the receipt of, estimated benefits. Sensitivity analysis should be used to test assumptions about operating costs and expected benefits.

**5.63** Adjustments should be empirically based, (e.g. using data from past projects or similar projects elsewhere), and adjusted for the unique characteristics of the project in hand. Cross-departmental guidance for generic project categories is available, and should be used in the absence of more specific evidence.<sup>12</sup> But if departments or agencies have a more robust evidence base for cost overruns and other instances of bias, this evidence should be used in

<sup>11</sup> Flyvbjerg, *Underestimating Costs in Public Works Projects – Error or Lie*, APA Journal (2002)

<sup>12</sup> *Review of Large Public Procurement in the UK*, published in July 2002 (available at <http://www.hm-treasury.gsi.gov.uk/>)

preference. When such information is not available, departments are encouraged to collect data to inform their estimates of optimism, and in the meantime use the available data that best fits the case in hand.

**5.64** Adjusting for optimism should provide a better estimate, earlier on, of key project parameters. Enforcing these adjustments for optimism bias is designed to complement and encourage, rather than replace, existing good practice, in terms of calculating project specific risk adjustments. They are also designed to encourage more accurate costing. Accordingly, adjustments for optimism may be reduced as more reliable estimates of relevant costs are built up, and project specific risk work is undertaken. Both cost estimates and adjustments for optimism should be independently reviewed before decisions are taken. Annex 4 provides further detail on how to deal with optimism bias.

### BOX 12: OPTIMISM BIAS EXAMPLE

The capital costs of a non-standard civil engineering project are estimated to be £50m NPC in a strategic outline business case (SOBC). No detailed risk analysis work has taken place at this stage, although significant costing work has been undertaken. The project team reports to the project board and applies an optimism bias adjustment of 70%, showing that, for the scope of work required, the total cost may increase by £35 million to £85 million in total. This is based on consultants' evidence, and experience from comparable civil engineering projects at a similar stage in the appraisal process.

As this potential cost is unaffordable, the chief executive requests reductions in the overall scope of the project, and more detailed work for the outline business case stage (OBC). As the project progresses, more costs and specific risks are identified explicitly, despite the reduced scope. For the final business case, the optimism bias adjustment is reduced until there remains only a general contingency of 5% for unspecified risks.

Without applying optimism bias adjustments, a false expectation would have been created that a larger project could be delivered, and at a lower cost.

## Valuing risks

**5.65** It is good practice to add a risk premium to provide the full expected value of the Base Case. As the previous section explained, in the early stages of an appraisal, this risk premium may be encompassed by a general uplift to a project's net present value, to offset and adjust for undue optimism. But as the appraisal proceeds, more project specific risks will have been identified, thus reducing the need for the more general optimism bias.

**5.66** An 'expected value' (EV) provides a single value for the expected impact of all risks. It is calculated by multiplying the likelihood of the risk occurring by the size of the outcome (as monetised), and summing the results for all the risks and outcomes. It is therefore best used when both the likelihood and outcome can be reasonably estimated.

**BOX 13: EXAMPLE OF EXPECTED VALUE OF BENEFITS**

A new policy was originally expected to generate significant benefits, but following concerns that the original predictions were over optimistic, further risk analysis has confirmed that there is now considerable uncertainty about some of these benefits being realised. Four potential outcomes are now considered possible, with NPVs and probabilities assessed as follows:

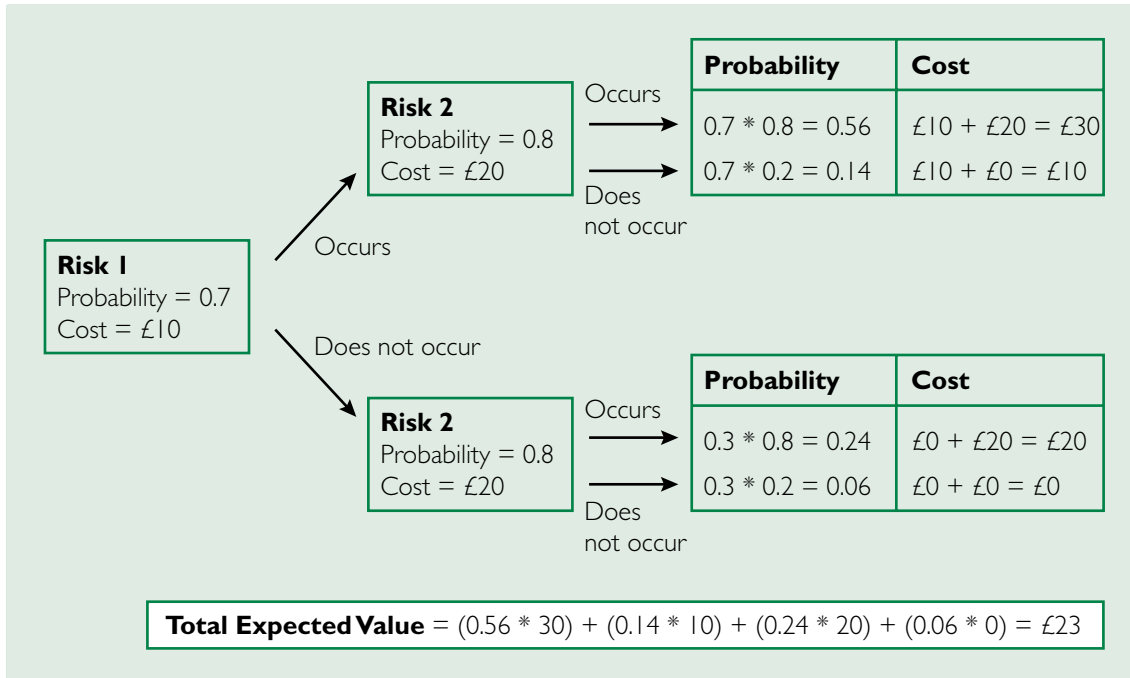
	<b>NPV</b>	<b>Probability</b>	<b>Benefits – Expected Values</b>
1	£10 million	0.2	£2 million
2	£20 million	0.4	£8 million
3	£30 million	0.3	£9 million
4	£40 million	0.1	£4 million
<b>Expected value</b>			<b>£23 million</b>

The costs of implementation have been more rigorously assessed at between £12-17 million, with an expected value of £15 million.

The expected net benefit is therefore £8 million NPV.

**5.67** Decision trees can be useful in this context. They are graphical representations useful in assessing situations in which the probabilities of particular events occurring depend on previous events, and can be used to calculate expected values in these more complex situations. For example, the likelihood of a particular volume of traffic using a road in the future might be dependent on the probability of movements in the oil price. Different scenarios can be analysed in this way.

**BOX 14: EXAMPLE – DECISION TREE**



## ASSESSING UNCERTAINTY

**5.68** An expected value is a useful starting point for understanding the impact of risk between different options. But however well risks are identified and analysed, the future is inherently uncertain. So it is also essential to consider how future uncertainties can affect the choice between options.

### Sensitivity analysis

**5.69** Sensitivity analysis is fundamental to appraisal. It is used to test the vulnerability of options to unavoidable future uncertainties. Spurious accuracy should be avoided, and it is essential to consider how conclusions may alter, given the likely range of values that key variables may take. Therefore, the need for sensitivity analysis should always be considered, and, in practice, dispensed with only in exceptional cases.

**5.70** The calculation of switching values shows by how much a variable would have to fall (if it is a benefit) or rise (if it is a cost) to make it not worth undertaking an option. This should be considered a crucial input into the decision as to whether a proposal should proceed. It therefore needs to be a prominent part of an appraisal.

**5.71** Examples of variables that are likely to be both inherently uncertain and fundamental to an appraisal are the growth of real wages, forecast revenues, demand, prices, and assumptions about the transfer of risks. A prior analysis of costs into fixed, step, variable, and semi variable categories can help in understanding the sensitivity of the total costs of proposals.

**BOX 15: EXAMPLE OF SENSITIVITY ANALYSIS**

A new IT system costs £1 million and is expected to yield staff savings of £150,000 per year over a period of 10 years. Discounting at 3.5 per cent the NPV of these costs and benefits is £247,000.

Suppose the estimates of staff savings assumed that the IT system would replace 15 staff with an average cost per person of £10,000. A possible sensitivity test is as follows: what if the IT system replaces only 10 staff? Staff savings would then fall to £100,000 per year and the NPV turns negative (minus £168,000).

**Scenarios**

**5.72** Scenarios are also useful in considering how options may be affected by future uncertainty. Scenarios should be chosen to draw attention to the major technical, economic and political uncertainties upon which the success of a proposal depends. Considering scenarios needs to be proportionate. It may take the form of asking simple 'what if' questions for small and medium sized projects, but extend to creating detailed models of future states of the world for major policies and large programmes. The expected NPV can be calculated for each scenario. It may also be helpful to undertake some sensitivity analysis within a scenario.

**BOX 16: EXAMPLE OF SCENARIOS**

Box 13 above shows that there is a 20 percent chance that there will be no net benefits (Outcome 1) but a 40 percent chance of net benefits of around £15 million NPV or more (Outcomes 3 and 4). Should it go ahead? Many other considerations then might play, such as whether there are other policies with more certain outcomes? Is it an essential policy area?

**Monte Carlo analysis**

**5.73** Monte Carlo analysis is a risk modelling technique that presents both the range, as well as the expected value, of the collective impact of various risks. It is useful when there are many variables with significant uncertainties. It can be a useful technique but expert advice is required to ensure it is properly applied, especially when risks are not independent of each other. Before undertaking or commissioning such an analysis, it is useful to know how data will be fed into the model, how the results will be presented, and how decisions may be affected by the information generated. An example of Monte Carlo analysis is provided in Annex 4.

## PREVENTING AND MITIGATING RISKS AND UNCERTAINTY

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**5.74** Following the identification and analysis of risks, the generation of an expected value, and an assessment of options' exposure to uncertainty, appraisers need next to look at strategies to prevent and mitigate risks and uncertainties. The following may be adopted:

- Consulting early;
- Avoiding irreversible decisions;
- Carrying out pilot studies;
- Building in flexibility from the start;
- Taking precautionary action;
- Transferring risk through contractual arrangements (insurance being an example);
- Developing less risky options, such as making less use of leading edge technology;
- Reinstating, or developing different options; or;
- Abandoning the project because it is too risky.

**5.75** Annex 4 provides more information on what mitigating action might be taken both before and during implementation.

## CONSIDERING UNVALUED COSTS AND BENEFITS

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**5.76** Costs and benefits that have not been valued should also be appraised; they should not be ignored simply because they cannot easily be valued. All costs and benefits must therefore be clearly described in an appraisal, and should be quantified where this is possible and meaningful.

**5.77** Research may need to be undertaken to determine the best unit of measurement. Alternative non-monetary measures might be considered most appropriate (See Box 17). For example, one of the benefits arising from a transport improvement is likely to be 'time saved'. These savings must be measured before attaching an aggregate monetary value. In many cases, more than one measure will need to be included to capture the different impacts of the proposal, and the different dimensions of those impacts. For example, there are a number of quantitative indices based on loudness, duration and variability of noise levels. Valuation techniques for use in these circumstances and examples of their application are set out in Annex 2.<sup>13</sup>

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<sup>13</sup> Reference can be made to the website of the Office of the Deputy Prime Minister: <http://www.odpm.gov.uk/>.

**BOX 17: EXAMPLE OF NON-MONETARY QUANTIFICATION: DESIGN QUALITY INDICATORS**

The Design Quality Indicator (DQI) is a method for assessing the design quality of buildings, which can be used by stakeholders involved in the production and use of buildings, including building users and visitors, and practitioners engaged in the commissioning, design, planning, production and management of the built environment.

The DQI can be used at any stage in the development process, from setting the brief, evaluating design proposals, during construction, and when a building is complete, to set and check that the intentions for the quality of the building are being met.<sup>14</sup>

**5.78** The most common technique used to compare both unvalued costs and benefits is weighting and scoring (sometimes called multi-criteria analysis). The basic approach to weighting and scoring involves assigning weights to criteria, and then scoring options in terms of how well they perform against those weighted criteria. The weighted scores are then summed, and these sums can be used to rank options. An even simpler method is to list the required performance criteria (sometimes called 'critical success factors'), and assess options in terms of whether they meet them or not.

**5.79** In practice, the weight to give to factors that are thought to be important by key players cannot be decided by 'experts'. They inevitably incorporate the judgments of stakeholders and decision makers. The risk that they are weighted towards acceptance of more expensive solutions by those who would enjoy the potential benefits should be tempered by at least one stakeholder representing the opportunities that an expensive solution would be foregone elsewhere. There are other pitfalls to avoid in carrying out this type of analysis, and reference should be made to guidance on multi-criteria analysis.<sup>15</sup>

<sup>14</sup> For further information refer to <http://dqi.org.uk>, <http://www.cic.org.uk>, or <http://www.cabe.org.uk>

<sup>15</sup> An introduction to multi-criteria decision analysis-weighting and scoring – is given in *Multi-Criteria Analysis*. A manual available from the ODPM website: <http://www.odpm.gov.uk> (see DTLR archive)

**BOX 18: EXAMPLE – WEIGHTING AND SCORING**

In order to support the introduction of a new training programme, and other departmental objectives, a new IT system is required. A budget of £900,000 is available. The project team discussed with managers and staff the relative importance of the unvalued benefits required of the new system, and submitted proposed weights to be used in the evaluation to the project board, which approved them. For the purposes of this example, only two of the benefits are shown.

<b>Benefit</b>	<b>Weight attached</b>
Ability to provide SMART management information	10
User friendliness – ease of data entry and screen management	20

Three options, based on different systems, were being appraised. Each member of the project user group provided a score for the user friendliness of the systems. Managers provided scores for the management information the systems provided. These were averaged to provide the following scores:

	<b>Management Information</b>	<b>User friendliness</b>
<i>Risk and optimism adjusted costs:</i>		
Option A £1,000,000	6	8
Option B £800,000	6	5
Option C £600,000	8	4

The weighted score of each option was therefore:

<b>Option A</b>	220
<b>Option B</b>	160
<b>Option C</b>	160

Option A has the highest score, but costs 25% more than option B, and 67% more than Option C, and is 11% greater than the available budget. Should it be accepted?

On a further analysis, a conservative estimate was that the time saving for staff from the user friendliness of the system, where Option A scores most highly, would come near to, or equal, the 67% extra cost over Option C. On the other hand, the additional management information – Option C’s strong point – could not be substantiated as leading to general improvements in performance. Option A also retained the flexibility for additional management information tools, which could be considered later as part of a separate, smaller business case.

On this basis, the Finance Director decided to fund Option A.



# DEVELOPING AND IMPLEMENTING THE SOLUTION

# 6

## INTRODUCTION

**6.1** Following the identification and description of all costs, benefits and risks, their valuation where feasible, and their testing through sensitivity and scenario analysis, the best option should be selected. Transparency is important at this stage, so that it is clear on what basis decisions are taken. Judgement over and above the component parts of the analysis is always called for in making decisions, but the following guidelines should be applied.

**6.2** Once an option has been selected, it will need to be refined into a solution. Consultation is important at this stage. Further consideration will need to be given to the implementation of the proposal, including the involvement of the private sector; procurement options and processes, and the programme and project management arrangements that may be required.

## SELECTING THE BEST OPTION

### Decision guidelines

**6.3** If a full cost benefit analysis has been undertaken, the best option is likely to be the one with the highest risk adjusted net present value. To the extent that all costs, benefits and risks have been robustly valued, this guideline can be applied with more certainty. In cost effectiveness analysis, the option with the lowest net present cost should be the best, again assuming that the cost estimates are as accurate and reliable as possible.

**6.4** If there is a budget ceiling, then the combination of proposals should be chosen that maximises the value of benefits. The ratio of the net present value to the expenditure falling within the constraint can be a useful guide to developing the best combination of proposals.

### BOX 19: EXAMPLE – PROJECT CHOICE

Consider the investment costs and expected net benefits of the following proposals:

	£million Initial investment	Expected net benefit (NPV)
A	10	4
B	6	3
C	4	3

- (a) If the budget were constrained to £10 million, proposals B and C would achieve the highest return, rather than proposal A, even though proposal A has the highest individual NPV.
- (b) If it is possible that elements of proposals A, B and C could be combined, within the constraint, to produce a significantly higher return, this should be investigated.

6.5 Other decision criteria can be used to help select options where risk is an important consideration. The 'maximin-return' option is the most important to consider. It is the most risk averse option, as it is the option that provides the least bad outcome if the worst possible conditions prevail.

**BOX 20: EXAMPLE – MAXIMIN RETURN**

Two government services are being considered, which are mutually exclusive. Their NPVs under different market conditions are shown below:

	Low demand (£)	Expected value (£)	High demand (£)
Service A	1,000,000	1,200,000	1,600,000
Service B	100,000	1,250,000	2,000,000

The maximin criteria points to Service A, as it provides the highest value in the worst market conditions.

6.6 In practice, other factors will also affect the selection of the best option, in particular the consideration of unvalued costs and benefits. Weighting and scoring techniques are useful in comparing different options in terms of the same criteria. However, as scores are not expressed in monetary terms, judgment is then required to compare the results of weighting and scoring with the cost benefit or cost effectiveness analysis. The two analyses should complement each other, and may indicate that further analysis is required before a decision can be reached. Annex 2 provides further information on how weighting and scoring can be brought into the decision making process. Fully involving stakeholders is very important in making judgments between monetised and non-monetised effects.

6.7 There is always a value imputed by decisions to proceed, and this value should always be clearly identified and analysed.

**BOX 21: EXAMPLE – SELECTING THE BEST OPTION**

Two lead options are being considered, with net present costs of £1 million and £3 million respectively, after taking into account valued benefits. To select the £3 million option, a decision maker would need to judge that the unvalued benefits of the project must be worth at least £2 million.

He or she needs to judge whether this is reasonable. Several considerations could help inform this judgment. Are there any measures of the unvalued benefits that could be used to derive unit values, which could help assess whether the £2 million is in fact worthwhile? Have values for this kind of benefit been estimated in other studies? Or are there better opportunities elsewhere for using the £2 million? What do the stakeholders think? And importantly, what do the stakeholders representing the opportunity of using the £2 million elsewhere think?

**6.8** The 'pay back period'<sup>1</sup> is sometimes put forward as a decision criterion. But payback ignores the differences in values over time, and the wider impacts of proposals. These drawbacks mean it should not generally be used as a decision criterion.

**6.9** Similarly, the 'internal rate of return'<sup>2</sup> (IRR) should be avoided as the decision criterion. Whilst it is very similar to NPV as a criterion, there are some circumstances in which it will provide different, and incorrect, answers. For instance, IRR can rank projects that are mutually exclusive differently from NPV.

## Affordability, funding, and cashflows

**6.10** The affordability of options should always be considered when developing and selecting options. In addition to the analysis of economic costs and benefits, appraisals usually need three major financial statements, at least for the lead options:

- ❑ A *budget* statement. This should be based on resource accounting and budgeting (RAB) principles, and show the resource costs over the lifetime of the proposal. For strategic initiatives, the budget will often comprise the forecast RAB financial statements of a whole organisation over a number of years.
- ❑ A *cashflow* statement. This should show the additional cash that will be spent on the lead option if it goes ahead.
- ❑ A *funding* statement. This should show which internal departments, partners and external organisations would provide the resources (and in some cases cash) required.

**6.11** Contingency arrangements should also be developed to ensure there is sufficient financial cover for risks and uncertainties.

### BOX 22: EXAMPLE – DIFFERENCES BETWEEN COSTS

A project affecting 1000 existing employees in Department A involves a new project team of 10 additional people, plus an informal 'secondment' from Department B of another 15 people for six months each. Department B has also agreed to fund half of the additional cashflows expected to be incurred.

- ❑ The additional *cashflows* involve the costs of employing the additional 10 people.
- ❑ The *economic cost* of the proposal includes the cashflows of the additional 10 people, the costs to the 1000 employees affected in Department A (for instance, reflecting the cost of their time), and the costs of the 15 staff transferred.
- ❑ A brief *funding statement* could show that Department B is providing half the additional cashflows expected to be incurred.
- ❑ Both departments will need to consider how the transfers affect their staff resource profiles, and potentially other internal budgets.

<sup>1</sup> A pay back period is the number of years before a project breaks even; when total (discounted or undiscounted) benefits (net of on-going costs) equal capital costs. This technique ignores all benefits and costs arising after the break-even date and is likely to distort project choice.

<sup>2</sup> The internal rate of return (IRR) is the discount rate that would give a proposal a present value of zero. IRR can be used to rank proposals. In the private sector, hurdle IRRs are often used to test whether a proposal should go ahead. The riskier the project is, the higher the hurdle IRR.

## DEVELOPING THE SOLUTION

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### Introduction

**6.12** The best option is likely to require further refinement before a solution emerges. Options are rarely completely mutually exclusive, so it is useful to review the other options to see if their good parts can be grafted onto the leading option.

### Consultation

**6.13** Consultation with external experts and with those affected is very important at this stage, whether or not formal or informal consultation has taken place earlier on.

**6.14** Consultation on projects will usually be on one or two lead proposals; whereas consultation on policy and programme proposals that have more widespread effects should usually be undertaken both earlier, and on a wide range of options and alternatives.

**6.15** Analysis of who is affected by a proposal, undertaken as part of the appraisal, may be very useful in determining who should be consulted, and also in considering the details of implementation. Attention should be drawn to the key assumptions, options and implementation issues. Consultation exercises should be drawn up in line with the following best practice guidelines:<sup>3</sup>

- Use the most appropriate approach. Written consultation may not be the best way to canvass views on a policy or project option. Methods include meetings with interested parties and user surveys.
- Consultation should be easy to respond to (e.g., by electronic means).
- Check if statutory obligations apply.
- Allow sufficient time; consultation should be built into the planning process at the start.
- Be clear about who is being consulted, about what, in what time-scale, for what purpose.
- Consider joining up with other consultations, for instance in other government departments.
- Consultation documents should be clear, concise and focused.
- Ensure that the process reaches the target audience.
- Ensure that people are told the results, and the reasons for decisions taken.

### Involving the private sector

**6.16** The extent of involvement of the private sector can vary from minor elements of a proposal being contracted-out through to full privatisation, with various forms of contracting, outsourcing and PPPs (including PFI) in between. Public bodies need to consider carefully which procurement route is likely to be most effective. In some cases, the appropriate balance between public or private sector provision will be clear. In others, the best solution must be identified across a range of public, private and partnership options.

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<sup>3</sup> For further information on carrying out consultation exercises, refer to the Cabinet Office (<http://www.cabinet-office.gov.uk/>)

**BOX 23: CONSIDERING PRIVATE SECTOR PROVISION**

Private sector provision may be more likely to provide a better solution where the scope for the following is greatest:

- ❑ Innovation to reduce costs or to improve observable outcomes;
- ❑ Generating additional revenue flows by sales to third parties;
- ❑ Reduction in risk of cost overrun or benefit shortfall;
- ❑ A contractor is able to exploit economies of scale in the provision of services (e.g. IT support or facilities maintenance);
- ❑ Savings in whole life costs and/ or for improved outcomes through effective design (e.g.: where a broad range of services may be provided in association with an asset, or when many inputs must be integrated in delivering a service, or where whole life and operating costs are importantly determined by good design);
- ❑ Clear specification of quality standards in absolute terms or in terms of client satisfaction;
- ❑ Ability of private sector to control discrete elements of the project without excessive oversight or interference; or;
- ❑ Clear boundaries and interfaces between public and private sectors.

Provision by the private sector may be less appropriate where:

- ❑ Risks which threaten the viability of a project are outside the control of the contractor (and these risks cannot be separated contractually from the project);
- ❑ The predominant risks are ones where the public sector has the comparative advantage in managing them;
- ❑ A large degree of discretion is required in determining the quality of services, and quality is not observable; or;
- ❑ Bidding costs are large in proportion to the value of the project (although there may be means of reducing these costs).

**Commercial agreements**

**6.17** Appraisals are generally made up of estimates that are forecast some time in advance of either the projected costs being incurred or benefits being realised. Any estimate made well in advance may or may not prove to be correct once a project has been implemented. The less well developed an appraisal, the greater the variability there is likely to be between the estimated value attached to a cost or benefit and the outturn.

**6.18** By transferring risk away from the public sector in different ways, different procurement options provide procuring authorities with choices about how they might manage and mitigate certain risks around estimated costs and benefits. For example, typically PFI contracts transfer to the PFI partner the risk that capital costs will exceed estimates made by the procuring authority in a way that some conventional contracts may not. Equally, a payment

mechanism that calibrates payments made under a contract with the delivery of well-defined benefits provides procuring authorities with a way of ensuring that certain costs are incurred only if certain benefits are delivered.

**6.19** The level of confidence that public bodies can have that estimated costs and benefits will be similar to eventual outturn will depend on:

- The length of time between the cost or benefit estimate being made and the date of contract award; and,
- The procurement option chosen.

**6.20** In relation to the latter, for example, costs which are fixed under contract and which become payable against measured milestones of physical progress in construction will have a higher probability of being incurred than costs which, although fixed under contract, are only payable to the extent that defined benefits, outcomes or contractual outputs associated with the contract are delivered. Comparisons between various procurement options need to take account of the impact that different contractual terms have on the likelihood that, in fact, certain costs will be incurred and benefits realised at the level estimated by the procuring body.

## Procurement processes

**6.21** OGC provides detailed guidance on the procurement options that are available, and how to conduct the relevant procurement process.<sup>4</sup> If the private sector is involved, proposals should be fully developed before tenders are invited. Where implementation will be by procurement, there are extensive requirements that need to be met under European Commission Directives and also under regulations within the United Kingdom.

**6.22** Often, these impose requirements over and above those stipulated by the Green Book, and must be complied with at all stages. Specialist advice can be sought from either the procurement unit within a department or agency or from OGC<sup>5</sup>, and from Partnerships UK<sup>6</sup> for PPP and PFI projects. The OGC also provides guidance on partnering arrangements.

## IMPLEMENTATION

**6.23** Implementation<sup>7</sup> plans should be sufficiently complete to enable decisions to be taken on whether or not to proceed. So that evaluations can be completed satisfactorily later on, it is important that during implementation, performance is tracked and measured, and data captured for later analysis.

## Programme and project management

**6.24** Economically justifiable and financially affordable proposals are of no value if realistically they cannot be implemented. The implementation of proposals must be considered as part of the appraisal process, enough to

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<sup>4</sup> See OGC website: <http://www.ogc.gov.uk/>

<sup>5</sup> Information on European practice is available from <http://europa.eu.int> and from OGC <http://www.ogc.gov.uk/>

<sup>6</sup> See <http://www.partnershipsuk.org.uk/>

<sup>7</sup> In this context, 'implementation' refers to those activities that are required during the period after appraisal to put in place a policy, or complete a programme or project.

ensure at least that proposals are viable, risks are manageable, and that benefits can be realised, before significant funds are committed. These aspects of appraisal develop iteratively as with the analysis of costs and benefits.

**6.25** Programme management is a structured framework for defining and implementing change within an organisation. It provides a framework for implementing business strategies and initiatives through the management of a portfolio of projects that give organisations the capability to achieve benefits that are of strategic importance. All large programmes should have recognised programme management methodologies.

**6.26** There should be an agreed approach to the management of projects, using recognised project management methodologies, such as PRINCE2.<sup>8</sup> Typically, this will involve identifying tasks and responsibilities and deadlines for completing them, and producing baseline schedules of milestones and activities (often in the form of Gantt charts). Progress against the base schedule should be reported on a regular basis. Guidance on project management is available from OGC.<sup>9</sup> Specific guidance is available on the management of construction projects.<sup>10</sup>

## Performance management and measurement

**6.27** Performance management concerns tracking the success of a policy, programme or project in achieving its objectives and in securing the expected benefits. For appraisal and evaluation purposes, it involves the systematic collection of data relating to the financial management and outcomes of the policy, programme or project during implementation.

**6.28** This provides an essential source of information, indicating the extent to which objectives are being achieved, giving an early warning of potential problems, and of the possible need to adapt the policy, programme or project to ensure success. Monitoring also provides information for the evaluation stage. To be fully effective, plans for monitoring must form part of the initial planning of a policy, programme or project.

**6.29** Effective performance measurement and monitoring means tracking all categories of benefit and ensuring that:

- Projects have defined target benefits and outputs;
- Ownership of the delivery of benefits remains with the programme manager;
- Outputs of a project or policy remain consistent with changing government objectives;
- Targets and achieved benefits are measured, reported and communicated;
- Costs are closely monitored and managed; and,
- Forecast costs and benefits are frequently reviewed.

**6.30** A monitoring system should establish:

- Whether management data is actually measuring what it purports to measure; and,
- Put in place sufficient controls to ensure that the data is accurate.

<sup>8</sup> See OGC website: <http://www.ogc.gov.uk/>

<sup>9</sup> See <http://www.ogc.gov.uk>

<sup>10</sup> OGC and HM Treasury have produced a series of ten procurement guides for construction projects. These are fully endorsed by the National Audit Office. <http://www.property.gov.uk/>

## Financial reporting

**6.31** Regular financial reporting on policies, programmes and projects should be performed. Reports may be integrated into the normal financial reporting cycle of an organisation, issued separately, or possibly combined with the reporting of progress against plan, benefits, and risks.

**6.32** Finance reports are likely to show expenditure to date, forecasts for the year, and variances against budgets. In large complex projects, the financial reporting is likely to integrate with contract management, with contractors providing regular 'Work In Progress' statements.

## Benefits realisation management

**6.33** Benefits realisation management is the identification of potential benefits, their planning, modelling and tracking, the assignment of responsibilities and authorities and their actual realisation. In many cases, benefits realisation management should be carried out as a duty separate from day to day project management.

**6.34** Benefits fall into four main categories, which are described below.

### BOX 24: BENEFIT CATEGORIES

Benefit		Example
Financial	Quantitative	Operating cost reduction, revenue increase
Non-financial	Quantitative	Number of customer complaints, reduction in road accidents, percentage of government departments on-line
Non-financial	Qualitative	Staff skills, staff morale
Outcomes	Quantitative and qualitative	Improved standards of healthcare

**6.35** It is also useful to identify financial savings that release cash for other uses.

## Contract management

**6.36** When contracts have been let, it will be important to ensure that the respective roles and responsibilities set out in the contract are fully understood and fulfilled to the contracted standard. The likelihood of the benefits being realised will be affected by the contractual terms, and any incentives built in to the contract. Where contracted standards are not fulfilled, the contracting public body should apply mechanisms established in the contract to rectify any under-performance. Guidance is available from OGC on dispute resolution.<sup>11</sup>

<sup>11</sup> See <http://www.ogc.gov.uk/>



## INTRODUCTION

**7.1** When any policy, programme or project is completed or has advanced to a pre-determined degree, it should undergo a comprehensive evaluation. Major or on-going programmes, involving a series of smaller capital projects, must also be subject to ex post evaluations.

**7.2** Evaluation examines the outcome of a policy, programme or project against what was expected, and is designed to ensure that the lessons learned are fed back into the decision-making process. This ensures government action is continually refined to reflect what best achieves objectives and promotes the public interest.

**7.3** Evaluation comprises a robust analysis, conducted in the same manner as an economic appraisal, and to which almost identical procedures apply. It focuses on conducting a cost benefit analysis, in the knowledge of what actually occurred rather than what is forecast to happen.

**7.4** In preparing for an evaluation, it is usually helpful to start with an outline plan, setting out the general boundaries of the proposed evaluation, including:

- Questions which it seeks to answer;
- Staff and other resources available;
- Provisional timing and cost; and
- Who should be consulted.

## EVALUATION PROCESS

**7.5** The evaluation itself would normally follow this sequence:

1. Establish exactly what is to be evaluated and how past outcomes can be measured.
2. Choose alternative states of the world and/or alternative management decisions as counterfactuals.
3. Compare the outcome with the target outcome, and with the effects of the chosen alternative states of the world and/or management decisions.
4. Present the results and recommendations.
5. Disseminate and use the results and recommendations.

Evaluation requires management initiative (sometimes political commitment) and intensive monitoring. The thoroughness of an evaluation should depend upon the scale of the impact of a policy, programme or project, and to some extent on the level of public interest. There may be a high level of media interest around a project which has required a significant degree of expenditure, or one which is highly complex, novel, or represents a pilot for future large scale programmes. Evaluation reports should be widely disseminated and published, where appropriate, to contribute to the knowledge base upon which future decisions will be taken.

## Establish what is to be evaluated

**7.6** The activity to be evaluated needs to be clearly specified. The evaluation might be of a project, programme or policy, particular aspects of the activity, or of key common issues affecting a number of activities. It might also be a pilot designed especially for evaluation.

**7.7** Objectives, outcomes and outputs should be defined and quantified as precisely as possible for use in step three below.<sup>1</sup> It is important to distinguish between the objectives and outcomes, and the outputs and targets.

**7.8** The availability of output and performance measures and targets, and other monitoring data, and how they relate to the objectives should be reviewed. If this information is inadequate, consideration should be given to the collection of additional data, although ideally, data needs would have been considered at the outset of the project.

## Alternative States / Management Decisions

**7.9** The definition of exactly what needs to be compared with what needs to be clearly stated. The outcome of any complex activity will never be exactly as projected in advance. However, the reasons for the outcome being better or worse than expected may be attributable to the 'state of the world', or to actions of the responsible body. These might include the management of the project, forecasting assumptions, or the inherent design of the policy.

## Compare the Outcome with Targets

**7.10** As discussed earlier, the technical methodologies used for appraisal and evaluation are similar. Each should identify and measure, where possible, both the direct and indirect benefits of the policy, programme or project. The main difference is that evaluation tends to be based on actual data, and appraisal on forecasts and projections.

**7.11** The evaluation should include the following:

- An assessment, quantified where possible, of what happened;
- A comparison with the target outcome; and
- A comparative assessment of one or more counterfactuals (i.e. alternative outcomes given different states of the world, or different management decisions).

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<sup>1</sup> The objectives, outcomes and outputs of a policy, programme or project should have been identified and documented during appraisal. See Chapter 4 for more detail.

**7.12** Where possible the comparative assessment should include a 'control group', to whom the activity was not applied.

**7.13** It is usual to take as a benchmark for comparison, what would have happened if the activity under consideration had not been implemented. It is also useful to consider the consequences of implementing one or more of the alternatives considered during appraisal. Occasionally it may be appropriate to consider an option that was not originally appraised, as long as it was feasible at the time of implementation.

**7.14** The evaluation should assess the success of the project, programme or policy in achieving its objectives, and also how this achievement has contributed to the wider outcomes. If the objectives were not achieved, the evaluation should establish why that was the case.

## Presentation of results and recommendations

**7.15** The results of an evaluation should summarise:

- Why the outturn differed from that foreseen in the appraisal;
- How effective the activity was in achieving its objectives, and why;
- The cost effectiveness of the activity; and
- What the results imply for future management or policy decisions.

**7.16** The results obtained should generally lead to recommendations for the future. These may include, for example, changes in procurement practice, delivery, or the continuation, modification, or replacement of a programme.

## Disseminate the results and recommendations

**7.17** The results and recommendations from evaluation should feed into future decision making. The methods used to achieve this will generally require senior management endorsement. Efforts should be made to disseminate the results widely, and, for this purpose, it may be helpful to use summaries of the main points, and reports which synthesise the results from a number of evaluations with common features.

**7.18** Evaluation reports and the research that informs them should be placed in the public domain unless there are good reasons, in terms of security or commercial confidentiality, for not doing so.

## Comparison of Appraisal and Evaluation

**7.19** Box 25 sets out the differences between undertaking an assessment at the outset, in support of government intervention – appraisal – and undertaking an assessment to evaluate how successful such action has been – evaluation.

**BOX 25: COMPARISON OF APPRAISAL AND EVALUATION**

	<b>Appraisal</b>	<b>Evaluation</b>
<b>Aim</b>	Ex ante assessment of whether action is worthwhile and impacts	Ex post assessment of whether action was worthwhile and impacts
<b>Use of Output</b>	Project procurement, policy and programme design	Feedback for: (a) future procurement, project management, (b) wider policy debate, and (c) future programme management.
<b>Application</b>	Projects, policies and programmes	Projects, policies and programmes
<b>Timing</b>	Always prior to implementation	<input type="checkbox"/> During implementation ('formative') <input type="checkbox"/> After implementation ('summative')
<b>Data</b>	Forecasted	Historic and current, estimated and actual. Estimates of counterfactuals
<b>Method</b>	Comparison of options against 'do nothing' option  Estimated assessment of risk	Comparison of results against 'do nothing' option Comparison of actual outturns against target outturns/ alternative outturns Assessment of risks that did or did not materialise
<b>Analytical Techniques</b>	Cost Benefit/ Effectiveness Analysis Discounted cash flow analysis Multi-criteria analysis Other statistical analysis	Cost Benefit/ Effectiveness Analysis Discounted cash flow analysis Multi-criteria analysis Other statistical analysis – e.g.: analysis of performance indicators
<b>Decision Criteria</b>	Comparison of NPV, NPC for different options Non quantifiable factors may be included if quantification impossible	Consideration of whether correct criteria were used
<b>Audit and Enforcement</b>	Public Accounts Committee (PAC), NAO, HMT, OGC Gateways 0, 1 Departmental arrangements	PAC, NAO, HMT, OGC Gateway 5, Departmental arrangements

**BOX 26: EXAMPLE 'EXPANDING VOCATIONAL TRAINING' - QUESTIONS FOR EVALUATION:**

- ❑ To what extent did the anticipated costs and benefits match the actual outcome ('benefits realisation')?
- ❑ In the light of experience with the target group of trainees, would better results have been achieved if this group had been more tightly defined, e.g. the alternative option of focusing purely on low or unskilled workers?
- ❑ Has any new information about the impact of vocational training come to light since the policy was implemented? (i.e. how effective is it in meeting objectives)?
- ❑ Were the risks assumed for completion of the training course justified or did they understate/exaggerate the true risk?
- ❑ Control group – how does the productivity of those individuals who undertook training compare to the productivity of workers of similar skill who were not offered training?

